KDIS Working Paper 24-16

# Global Climate Action and Local Rights: Survey Experimental Evidence on Public Support for Carbon Offsetting in Liberia

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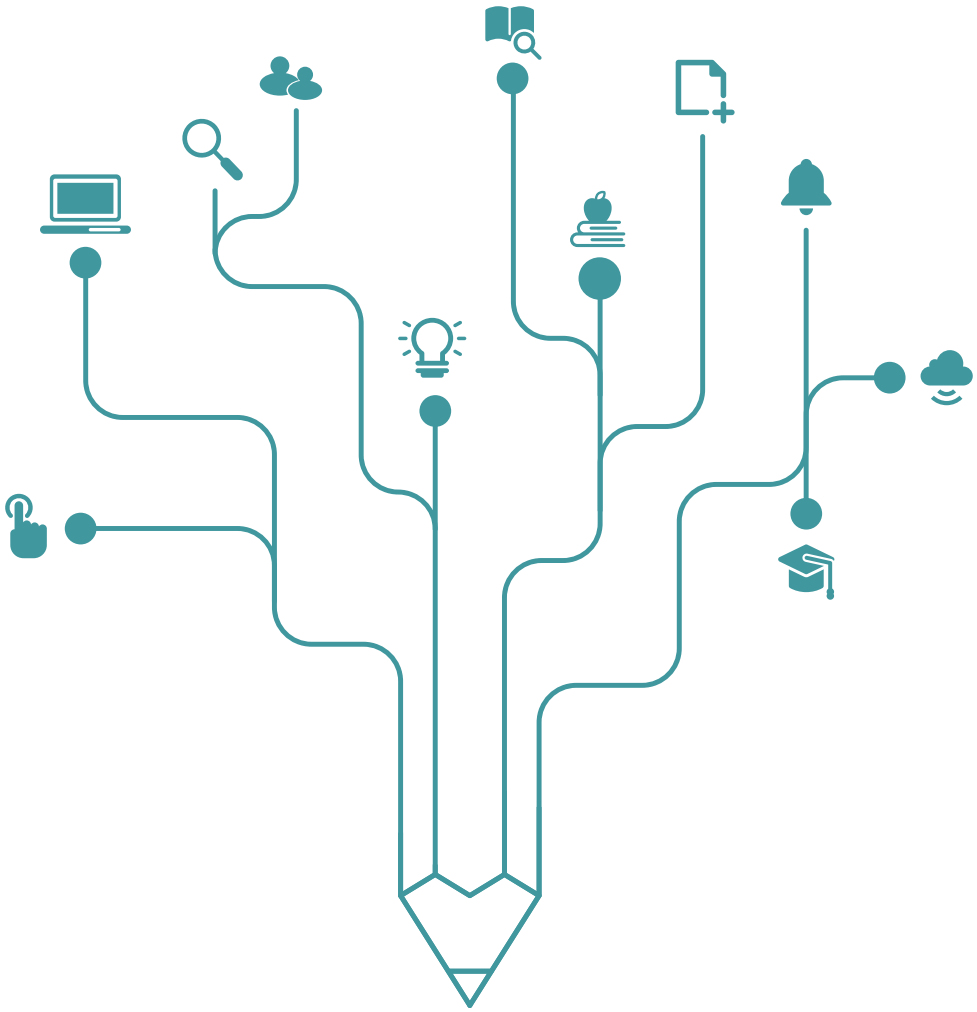

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# Global Climate Action and Local Rights: Survey Experimental Evidence on Public Support for Carbon Offsetting in Liberia*

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August 2024

**Abstract**

When do citizens in developing countries support climate change action, such as carbon offsetting? Carbon offsetting, aimed at achieving a net zero carbon footprint through investments in renewable energy, forest conservation, or reforestation, is endorsed by many international organizations and climate agreements. However, its implementation in the Global South raises concerns about potential adverse effects on local communities, particularly those reliant on forest resources. Through an original survey experiment conducted in Liberia, we examine how different framings of carbon offsetting projects influence public support. Our findings reveal that negative framing, particularly highlighting the risks of land dispossession and project ineffectiveness, significantly reduces support for carbon offsetting, especially among individuals with personal ties to forest communities. Conversely, positive framing emphasizing economic and environmental benefits is less effective in generating support. The results underscore the importance of incorporating local perspectives and addressing equity concerns in the design and communication of climate policies to ensure their political sustainability in host countries. This study contributes to the broader literature on climate policy by providing insights into the public's reception of global climate initiatives in developing country contexts.

*Keywords:* carbon offsetting, forest conservation, local livelihoods, public support, survey experiment

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# 1 Introduction

Carbon markets, commonly referred to as cap-and-trade systems, have gained considerable attention as a promising climate mitigation policy despite the debates over its effectiveness.[1] Within an emissions trading system (ETS), firms receive a set allowance of greenhouse gas (GHG) emissions from the government (IPCC, 2015; Broome, 2012). To comply, firms must either reduce their emissions at the source or purchase additional carbon credits. Alternatively, they can participate in carbon offsetting to compensate for their emissions. A popular form of carbon offsetting involves rainforest conservation efforts aimed at preventing deforestation. However, there is a growing concern over whether this ambitious climate policy can garner political support, especially in the Global South, where most rainforests are located.

In 2023, Blue Carbon, a company based in Dubai, secured a series of carbon offsetting agreements with several African governments. The scope of these deals is immense, covering an area larger than the United Kingdom.[2] Under these agreements, Blue Carbon will hold exclusive rights to sell carbon credits for a 30-year period, retaining 70% of the revenue from credit sales. For instance, in March 2023, the Liberian government signed a memorandum of understanding (MOU) with Blue Carbon, granting the firm exclusive rights to generate and sell carbon credits from approximately 1 million hectares of Liberia's forests, which represents 10% of the country's land area.

A key question is whether the climate mitigation policy is *politically* sustainable in host countries in the longer run. Not surprisingly, international firms and political leaders in Africa support the large-scale carbon offset projects involving forest communities. For example, Kenyan President William Ruto said the continent's carbon resources are an "unparalleled economic

[1] Guardian, 2023, "Critical or concerning? Cop28 debates role of carbon markets in climate crisis" (Accessed on August, 19, 2024)

[2] AP News, 2023, "A Dubai company's staggering land deals in Africa raise fears about risks to Indigenous livelihoods" (Accessed on August 19, 2024)

goldmine."[3] On the other hand, experts and civil society organizations (CSOs) are increasingly concerned about their detrimental impacts on local communities whose lives depend on rainforests. Forest communities often do not have prior and full consent before the deal is signed. In the worst case, the deal could lead to the eviction of "the very communities who know best how to conserve their forests."[4]

Although balancing global climate action with local rights is becoming more complex, there is surprisingly little understanding of the conditions under which host country citizens support carbon offsetting projects. Building on the vast public opinion literature regarding climate change mitigation policy, we conducted an original survey experiment with roughly 2,000 respondents in urban Liberia, a country directly impacted by the Blue Carbon deals. Specifically, informed by ongoing policy debates and prior public opinion research, we examined how information about the potential impacts affects the individual citizen's support for their government's involvement in carbon offsetting deals.

We cross-randomized positive and negative information about carbon offset projects' impact on host countries. Before receiving the treatment, all respondents were provided with a common narrative about carbon offsetting projects. The information contained brief explanations about climate change, its negative effects, and the concept of the carbon market and carbon offsets as a climate change mitigation policy. This step was essential because the education level is typically lower in low-income countries, and we wanted to ensure that all respondents had a basic understanding of carbon offsets.

Respondents then were randomly assigned to one of the four conditions: (1) Positive narrative, (2) Negative narrative, (3) Both positive and negative narrative, and (4) Control (i.e., just the common narrative). The positive narrative emphasized the potential benefits of the

[3]Guardian, 2023, "The new 'scramble for Africa': how a UAE sheikh quietly made carbon deals for forests bigger than UK" (Accessed on August 19, 2024)

[4]CNN, 2023, "A UAE company has secured African land the size of the UK for controversial carbon offset projects" (Accessed on August 19, 2024)

projects, including financial gain, environmental protection, and green technology adaptation at the country level. In contrast, the negative narrative scored the potential risks of the carbon deals, including eviction and migration of forest communities and below-par effectiveness of the carbon offset projects. Those narratives reflect issue positions taken by various real-world stakeholders.

This study tests four hypotheses regarding public support for carbon offsets. First, we hypothesize that framing effects will lead to increased support when positive information is provided and decreased support when negative information is presented, although mixed messages may neutralize these effects. Second, the impact of this information is expected to be more significant among respondents with personal ties to affected communities, reflecting interest-driven reasoning. Third, politically motivated reasoning suggests that support will vary based on voters' ethnic and political affiliations, with coethnics and copartisans of the incumbent responding more favorably to positive information and non-coethnics and non-copartisans more negatively to negative information. Last, the moderating role of prior knowledge is expected to diminish framing effects among those with greater familiarity with the policy issue.

For our sampling strategy, we deliberately chose an urban slum neighborhood as a survey site in Liberia for three reasons. First, the selected neighborhood has a high proportion of internal migrants from inland forest communities. This allows for comparing urban citizens with and without family or friend connections to forest communities. In our sample, more than 42% of the respondents had such ties, enabling us to test how material interest moderates the effect of information about the policy impacts. Second, previous research on African politics suggests that political mobilization in urban Africa can lead to significant policy changes, for example, through protests and riots. Therefore, shedding light on the public opinion of urban citizens can be more informative.

Our empirical findings reveal several key insights into public attitudes towards carbon offsetting projects in Liberia. The results indicate that negative framing of the potential harms of

such projects significantly decreases public support, particularly among individuals with ties to forest-dependent communities. In contrast, positive framing alone was less effective in garnering support, and when both positive and negative narratives were presented together, they largely neutralized each other's impact. Additionally, while political affiliations did influence reactions to the narratives, the effects were more complex and not entirely consistent with expectations of politically motivated reasoning. Furthermore, respondents with greater prior knowledge of climate change exhibited more resistance to framing effects, underscoring the importance of informed public discourse in shaping opinions on environmental policies. These findings together highlight the challenges in securing broad-based support for carbon offsetting initiatives, particularly in contexts where local livelihoods are directly impacted.

This study makes a number of important contributions to the literature on public support for climate change mitigation policies. First, departing from the vast majority of the extant work, we examine the public support for carbon offset projects in *developing countries* whose cooperation will be crucial for ambitious climate change mitigation policies. Our study is relevant to the current policy debate because of the survey site selection. Second, echoing the takeaways from prior research, we re-confirm that ethical considerations and fairness principles are a key determinant of public support for carbon offset projects. Lack of respect for local rights and inadequate compensation schemes can severely undermine the legitimacy and acceptance of these initiatives. Third, the above takeaways are similar to public support for climate policies in advanced democracies. However, consensus building and equitable distribution could be harder in hybrid regimes in developing countries. This is especially because host citizens' political trust in their government tends to be lower in developing countries.

# 2 Local Public Support for Global Climate Action

## 2.1 Carbon Offsets and the Debates about its Effectiveness

Much of the discussion around carbon offsetting has centered on its effectiveness in reducing greenhouse gas emissions and its potential to contribute to global climate change mitigation efforts. Carbon offsetting, a mechanism designed to achieve net-zero carbon emissions through investments in projects like renewable energy, forest conservation, and reforestation, has garnered significant support from international organizations and is integral to many climate agreements. However, its effectiveness remains a contentious issue, sparking debates about the design and transparency of these programs (Watt, 2021). Critical research emphasizes the need for robust frameworks that ensure the integrity of carbon offset initiatives, including accurate accounting systems and clear criteria for evaluating successful offsets (Arendt, 2024). Scholars highlight the importance of well-defined metrics and rigorous methodologies to assess carbon savings, as the lack of standardized approaches can undermine the credibility and impact of these programs (Stapp et al., 2023).

The debate surrounding carbon offset programs also centers on concerns that they may enable companies to maintain high emissions by offering a "license to pollute." Critics argue that some offsetting schemes result in only nominal contributions to environmental efforts, raising doubts about their real impact on emission reductions and sustainability. A recent meta analysis by Huber, Bach, and Finkbeiner (2024) underscores these concerns, identifying both consensus and divergence in the quality criteria for offsets, such as "additionality" and "permanence," and calling for standardized evaluation methods. Similarly, Pan et al. (2022) highlights the challenges faced by Forest Carbon Offset (FCO) projects, including carbon leakage and cost-effectiveness, which must be addressed to enhance their role in global emission reduction strategies. These ongoing academic debates stress the need for continuous scrutiny and improvement in the design and implementation of carbon offset programs to ensure they

genuinely contribute to climate mitigation without compromising environmental integrity.

## 2.2 Public Support for Global Climate Action across the Globe

Yet, the broader discussion about climate change mitigation increasingly emphasizes the importance of international cooperation (Andre et al., 2024; Bechtel, Scheve, and van Lieshout, 2022). While formulating effective climate policies is a significant challenge, securing public support for these policies domestically is equally important. In other words, global climate action must be politically sustainable in order to be implemented by governments in the long run (Klenert et al., 2018). Consequently, an increasing number of studies are investigating the factors that influence public support for climate change mitigation policies (Peng et al., 2021).

Despite growing concerns over climate change (Bergquist and Warshaw, 2019; Egan and Mullin, 2012) and strong global support for climate action (Andre et al., 2024; Mildenberger and Tingley, 2017), public opinion literature suggests there are two key barriers to building public support for international climate policy: collection action problems and distributional conflicts. First, climate change mitigation is a global public good and countries should overcome the collective action problem. Due to the free-riding concerns, "deep" international cooperation (as opposed to "shallow" cooperation), especially between the Global North and South, is harder to achieve (Keohane and Oppenheimer, 2016). Prior research finds public support for extrinsic reciprocity where countries enforce cooperation by linking issues (Tingley and Tomz, 2014). In the absence of a formal enforcement mechanism, naming, and shaming can be an effective strategy for enforcing international climate agreements (Tingley and Tomz, 2022; Dannenberg et al., 2023).

Second, because climate change mitigation is extremely costly, the distributional conflicts between and within countries are another significant barrier (Aklin and Mildenberger, 2020; Bechtel, Scheve, and van Lieshout, 2022; Gaikwad, Genovese, and Tingley, 2022; Colgan and Hinthorn, 2023). A "just" transition seeks to ensure that the economic and social costs of cli-

mate change mitigation are distributed fairly. Numerous studies emphasize that fairness principles are key to designing policies that garner broader public support (Bechtel and Scheve, 2013; Bechtel, Scheve, and van Lieshout, 2022; Gaikwad, Genovese, and Tingley, 2023). Specifically, justice considerations that distribute costs fairly between countries and compensate for vulnerable communities significantly boost public support for climate actions.

Notably, Gaikwad, Genovese, and Tingley (2022) distinguishes two groups of "climate losers" from which mitigation compensation and investment schemes should secure policy buy-in for building broader coalitions. First one is the *climate change vulnerable* group, actors whose livelihoods are threatened by climate change. Second one is the *policy vulnerable* group, actors who "may be sensitive to the material costs of addressing climate change" [1165]. One such group is actors involved with coal industry. Public opinion of those groups are important for two reasons. Whether climate policies reflect the preference of those groups have *direct* effects on electoral outcomes (Bolet, Green, and González-Eguino, 2023; Stokes, 2016). More importantly, whether compensation mechanisms are perceived as fair to concerned parties have *indirect* effects on the public support of much broader segment of a society.

Yet, most existing studies so far have focused on distributional conflicts either in the Global North, or regarding specific stakeholder, namely fossil fuel communities (Gaikwad, Genovese, and Tingley, 2022, 2023; Mohlakoana et al., 2023; Blankenship et al., 2022). In other words, we know surprisingly little about public opinion other communities in the Global South, such as rain forest communities despite their importance in global efforts for carbon offsets. More specifically, we do not know (1) their policy preferences regarding carbon offsetting projects (and their compensation mechanisms) and (2) how the public in host countries would respond to global climate policies which may have detrimental impacts on forest communities, another critical vulnerable group. While both tasks are equally important to test for the political feasibility of the mitigation strategy, we fill the gap in the literature by focusing esperically on the latter using a framing survey experiment.

Along with CSOs and advocacy groups, policy experts and academics are gradually becoming concerned about the negative effects of carbon offsetting projects on forest communities in host countries. Albrecht and Gravesen (2023) point out that one of the three frontlines in Africa's resource conflicts comes from the "green" transition and nature conservation, which are implemented at the expense of local communities' livelihoods. The key issue is that local preferences are underrepresented in the policymaking process, and foreign investors are not held to the same stringent legal standards as they are in their home countries (Albrecht et al., 2023). For example, Cavanagh and Benjaminsen (2014) report the forceful eviction of the local residents in the carbon offset project area in eastern Uganda. In addition, according to Cavanagh et al. (2021), the financial compensation for Kenyan farmers who participated in a carbon offsetting project was substantially lower than expected. In sum, those violations of local rights, restrictions on land use, and poor treatment of local communities can be a source of social conflict in host countries (Bluwstein and Cavanagh, 2023), significantly limiting the effectiveness of the global mitigation strategy (Seddon, 2022).

## 3 Our Approach

In this paper, we consider does information about carbon offsetting projects influence public support for government involvement. Based on the literature on political communication and climate change, we derive four testable hypotheses.

### 3.1 Issue Framing Effects

Prior political communication research shows that issue framing can alter citizens' preferences (Druckman, 2004). Issue framing effects are situations where "by emphasizing a subset of potentially relevant considerations, a speaker leads individuals to focus on these considerations when constructing their opinions." (Druckman, 2004: 672). In our case, describing carbon offsetting projects in terms of solutions to climate change and economic opportunities as opposed to concerns over respect for local rights causes respondents to base their opinions on

instrumental benefits instead of ethical considerations. Past studies on public opinion regarding energy and climate change show that issue framing effects are robust across many different contexts: for example, public opinion about hydraulic fracturing in the US (Bayer and Ovodenko, 2019), carbon offsetting in the US (Anderson and Bernauer, 2016), renewable energy policy in the US (Stokes and Warshaw, 2017), the EU carbon border adjustment mechanism in Europe (Bayer et al., 2024), and climate action's sector-specific effects in Europe (Bayer and Aklin, 2020).[5] Consistent with prior research, we expect that positive (negative) information will increase (decrease) public support for carbon offsetting projects among Liberian citizens.

However, most controversial policy debates present the public two-sided arguments–both supporting and opposing. Carbon offsetting projects in the Global South are no exception; voters are exposed to political elites' rhetoric and civil society's concerns at the same time. Existing theory on framing effects also focuses on the competitive contexts in which both frames are conveyed to citizens (Chong and Druckman, 2007, 2013). While the size of counterframing effects varies, counterframes tend to cancel out the counterpart's effects. For example, Aklin and Urpelainen (2013) find that various combinations of positive and negative framing have minimal impact on support for clean energy policy. Such neutralizing effects of counterframes are reported in many other experiments (e.g., Bayer and Aklin (2020); Bayer and Genovese (2020)). Therefore, we expect that the combination of positive and negative information will not affect public support for carbon offsets.

**Hypothesis 1 (Framing effects)**: The positive (negative) information treatment increases (decreases) public support for the government's carbon offsetting policy. Receiving both positive and negative information treatments does not change public support.

[5]However, Bernauer and McGrath (2016) report that in their experiments, reframing greenhouse gas mitigation efforts and their benefits did not increase public support for climate action.

## 3.2 Interest-Driven Reasoning

Extensive, long-standing studies on climate change suggest that material interests are an important driver of voters' attitudes toward mitigation strategies. Climate actions generally have distributional consequences, and respondents are sensitive to how benefits and costs are allocated across different social groups (Bechtel and Scheve, 2013; Tingley and Tomz, 2014). Consistent with the "pocketbook logic," citizens usually do not support climate actions costly to them or their social group (Dechezlepretre et al., 2024; Christenson, Goldfarb, and Kriner, 2017; Aklin, 2021; Bechtel, Genovese, and Scheve, 2019; Stokes, 2016). Hence, finding out acceptable compensation mechanisms (Gaikwad, Genovese, and Tingley, 2022) or linking climate action with other economic and social policies can be instrumental (Bergquist, Mildenberger, and Stokes, 2020)

One testable hypothesis related to this literature is that survey respondents are more responsive to issue framing when material benefits and costs are more relevant to them. For example, Bayer and Genovese (2020) find that the UK respondents are responsive to distributional effects in their *home* country while discount distribution effects from *abroad*, which they name "home bias." The same logic can be applied to the Liberian context. The information treatment would impact only those respondents who will be directly–either positively or negatively–affected by the policy. Specifically, we expect the treatment to have an impact on urban respondents who have close family or friend ties to those communities. In contrast, respondents without such connections are less likely to respond to the information treatment, regardless of whether it is positive or negative.

**Hypothesis 2 (Interest-driven reasoning)**: the positive (negative) information treatment increases (decreases) public support for the government's carbon offsetting policy only among respondents with ties to rainforest communities.

## 3.3 Politically Motivated Reasoning

Prior research on public opinion regarding climate change shows that politically motivated reasoning is an ostensible barrier to effectual scientific communication (Hart and Nisbet, 2012; Bolsen, Druckman, and Cook, 2014). Individuals reject credible scientific information because it contradicts their political beliefs (Druckman and McGrath, 2019). For example, in the US, the partisan gap is so wide to the extent that new information does not affect the citizens' support for clean energy alternatives (Aklin and Urpelainen, 2013). While most studies find evidence in favor of motivated reasoning in advanced democracies (e.g. Bayer and Schaffer, 2024; Christenson, Goldfarb, and Kriner, 2017), voters' reasoning in new democracies can be politically motivated too.

In the context of sub-Saharan Africa, many argue that political affiliations are heavily influenced by ethnic identities, and thus reasoning can be shaped by a one's partisanship and ethnic identity. For example, Adida et al. (2017) find that in Benin, voters may respond to new information only if it aligns with and reinforces their social identity. Specifically, voters view high-performing incumbents more favorably if they are coethnics and perceive poor performers more negatively if they are non-coethnics. Similarly, information about the government's environmental policy might influence public support differently based on the respondent's ethnic identity and political affiliation. Therefore, we expect that voters who share the same ethnicity (coethnic) or political affiliation (copartisan) with the incumbent president will respond only to the positive information. Conversely, non-coethnic or non-copartisan voters will react only to the negative information because they do not align with their social identity or political loyalties.

**Hypothesis 3 (Politically motivated reasoning)**: the positive information treatment increases the public support for the government's carbon offsetting policy only among copartisan/coethnic voters of the incumbent president; in contrast, the negative information treat-

ment decreases the public support for the government's carbon offsetting policy only among non-copartisan/non-coethnic voters of the incumbent president.

### 3.4 Prior Knowledge

Previous studies on framing effects and climate public opinion indicate that individuals react to information differently based on their existing knowledge of the topic. Simply put, the framing effects will be the greatest among respondents with no to little prior understanding of the topic. In contrast, the size of the effects will be minimal for respondents who are very knowledgeable about the policy issue. That is, prior knowledge, information, and "expertise" of individual respondents can limit framing effects (Druckman, 2004). The level of knowledge moderates the duration of framing effects (Lecheler and De Vreese, 2011). Choma, Hanoch, and Currie (2016) find that basic scientific knowledge moderates the relationship between a respondent's partisanship and public support for new energy technology in the US.[6] These theoretic prediction leads to the following hypothesis.

**Hypothesis 4 (Prior knowledge)**: The size of framing effects on the public support for the government's carbon offsetting policy will be moderated by a respondent's prior knowledge or information level. Specifically, the effect will be smaller for respondents with a higher level of knowledge compared to those with a lower level.

## 4 Data and Experimental Design

### 4.1 Study Context: Liberia

Liberia, a West African country rich in natural resources and biodiversity, presents a unique case for studying the dynamics of carbon offsetting and local support for climate change action. In March 2023, Liberia entered a significant deal with Blue Carbon, a company based

[6] In contrast, Bayer and Ovodenko (2019) do not find evidence in favor of the moderating role of prior information in the framing effects on public support for fracking in the US.

in the United Arab Emirates (UAE) (Hearst, 2023; Canby, 2024). This deal aims to protect approximately one million hectares of Liberia's forested land, primarily through reforestation and conservation projects designed to generate carbon credits. These credits are intended to be sold in international markets, providing financial resources for further conservation efforts and contributing to global carbon reduction goals.

The implications of this deal are profound for Liberia's counties, particularly those heavily forested and dependent on forest resources for local livelihoods. Counties such as Nimba, Lofa, and Grand Gedeh, which have substantial forest cover, are likely to be the primary focus of these carbon offsetting projects. While the deal promises potential economic benefits through the creation of jobs in conservation and the influx of funds from carbon credit sales, it also raises concerns about the impact on local communities. There are fears that enforcing conservation measures could restrict access to forest resources, which are vital for the livelihoods of many Liberians involved in logging, farming, and other forest-dependent activities. Moreover, as the implementation of such a large-scale project necessitates careful consideration of local property rights and effective engagement with local communities to ensure that their needs and rights are respected, there have been even concerns about potential displacements and force migration of the current residents (Siakor, 2023; Matata, 2024). The success of the Blue Carbon deal in Liberia will largely depend on balancing the environmental goals with the socio-economic realities of the host country nationals. Understanding local perspectives and addressing concerns about the effectiveness and fairness of carbon offsetting initiatives will be crucial in gaining broader support and ensuring the long-term sustainability of these climate actions.

## 4.2 Data Collection

To study these questions, we conducted a survey with 2,072 respondents in Monrovia, in December 2023.

## 4.3 Experimental Design

In our study, we utilized a survey experiment to explore the conditions under which host country citizens support carbon offsetting projects. We cross-randomized different narratives about carbon offsetting, and measure their impacts on attitudes and support levels of carbon offsetting projects. Figure 1 illustrates the experimental design of our survey.[7]

First, to ensure all participants had a basic understanding of carbon offsetting, we provided a "common narrative" that was neutral and informative. This narrative explained the concept of carbon offsetting and its relevance to Liberia:

### Common information on carbon offsetting

> *Climate change is making our weather unpredictable, like unexpected heavy rains or long dry spells, and causing sea levels to rise. This often happens because of carbon emissions – gases from burning things like oil and coal. These gases make the Earth warmer. It's a big problem for Africa, and Liberia feels it strongly. Our farming and coasts are suffering from droughts, land turning into desert, and food shortages. There's an idea to help with this called carbon offsetting. It's like a trade. People and companies who release gases that warm the planet can pay for projects that help reduce these gases somewhere else. For example, a company from another country might make a deal with Liberia. They would take care of a big area of our forests – about 10% of Liberia's land – for 30 years. They do this to earn 'carbon credits', which are like points for helping lower global emissions. In this deal, Liberian government wouldn't manage these forests, but Liberia can earn from the carbon credits.*

Following the common narrative, participants were randomly assigned to receive either

[7] Within Group 4, we further randomized the order in which the positive framing and the negative framing treatments appears in order to ensure that we can check whether the order of the presentation affects the treatment effects.

a positive or negative narrative about carbon offsetting. These narratives were designed to emphasize the potential benefits or risks associated with carbon offsetting projects. It is noteworthy that those narratives are informed by Anderson and Bernauer (2016) and current policy debates. Specifically, using an online framing experiment in the US, Anderson and Bernauer (2016) demonstrate that economic efficiency considerations boost public support. On the contrary, ethical concerns and concerns over carbon offsets' effectiveness in climate change mitigation diminish public support. Yet, their framing of ethical considerations involve the concept of the "right to pollute" (Dhanda and Hartman, 2011) rather than concerns over local rights in carbon offset projects sites in the Global South.

### Positive narrative

> *Carbon offsetting projects can be good for countries like Liberia. They bring in money from other countries, help us take care of our environment and all the different plants and animals, and can even bring in new, cleaner ways of doing things.*

### Negative narrative

> *Carbon offsetting projects can cause problems. Sometimes, they can take away land that local people have always used, forcing them to move. People who depend on the forests for their living might lose out. Also, these projects don't always cut down on the gases that cause climate change as much as they should.*

The cross-randomization of positive and negative narratives, which are designed based on commonly shared narratives about these projects, enabled us to examine how different framings of carbon offsetting influenced participants' support. By comparing responses across these varied informational treatments, we aimed to identify the conditions under which support for carbon offsetting projects could be maximized or minimized.

Figure 1: Experimental Design

| | | **Positive narrative** about carbon offsetting | |
|---|---|---|---|
| | | No | Yes |
| **Negative narrative** about carbon offsetting | No | Group 1<br>• Common information | Group 2<br>• Common information<br>• **Positive** narrative |
| | Yes | Group 3<br>• Common information<br>• **Negative** narrative | Group 4<br>• Common information<br>• **Positive** narrative<br>• **Negative** narrative |

## 4.4 Respondent Characteristics and Experimental Balance Check

Table 1 presents summary statistics and an experimental balance check for the survey sample, examining whether the treatment groups and the control group are significantly different across various background characteristics and baseline understanding about climate change.

As in Panel A, the average age of respondents is about 33 years. About 63% of the respondents are female, with an average of 9.05 years of education. A vast majority, 98%, identify as Christian, and 48% have a paid job. The average monthly income is $89.21 USD, and the average value of durables is $151.93 USD. Comparing these figures to country-wide averages from the Liberia Household Income and Expenditure Survey (HIES) 2016-2017, our sample more educated (against 5.2 years of education) and earn more income (against approximately $60 of monthly income). Importantly, thirteen percent of which are from counties affected by Blue Carbon projects, and 46% have family ties to the forestry-related industry.

Panel B reports outcomes related to basic understanding about climate change. A majority (71%) of respondents have heard about climate change. The perceived impact of climate

change on Liberia is rated at 3.46 on a scale from 1 to 5. Concern about drought, floods, and other climate-related issues is high, with an average rating of 4.50. The perceived importance of the role of ordinary Liberians in addressing climate change is rated at 3.81, while the perceived importance of imminent government action is rated at 4.25. Finally, 74% of respondents believe the government has primary responsibility for addressing climate change. However, only 8% knew about the company Blue Carbon prior to the survey.

Overall, the experimental groups are balanced across these characteristics, with only minor and non-systematic differences observed.

Table 1: Summary Statistics and Experimental Balance

| | (1) Mean (SD) | (2) Coefficient on Difference (Treatment - Control) | (3) | (4) |
|---|---|---|---|---|
| | Common Narrative Group | Positive narrative | Negative narrative | Positive + Negative |
| **Panel A. Respondent background** | | | | |
| Age | 32.94 | -0.41 | -0.03 | 0.59 |
| | (12.21) | (0.62) | (0.66) | (0.64) |
| =1 if female | 0.63 | 0.01 | -0.01 | 0.03 |
| | | (0.02) | (0.02) | (0.02) |
| Years of education | 9.05 | -0.47** | 0.02 | 0.19 |
| | (4.47) | (0.23) | (0.24) | (0.23) |
| =1 if Christian | 0.98 | -0.02* | 0.01 | -0.01 |
| | | (0.01) | (0.01) | (0.01) |
| =1 if has a paid job | 0.48 | 0.01 | -0.04 | 0.01 |
| | | (0.03) | (0.03) | (0.03) |
| Income (USD, monthly) | 89.21 | -11.29* | 10.81 | -1.50 |
| | (98.48) | (6.32) | (8.18) | (7.04) |
| Value of durables (USD) | 151.93 | 6.22 | 0.70 | -9.55 |
| | (385.78) | (20.04) | (19.04) | (18.26) |
| =1 if from county affected by Blue Carbon | 0.13 | 0.02 | -0.00 | -0.00 |
| | | (0.02) | (0.02) | (0.02) |
| =1 if has family ties to forestry-related industry | 0.46 | 0.00 | 0.03 | -0.04 |
| | | (0.03) | (0.03) | (0.03) |
| **Panel B. Baseline understanding about climate change** | | | | |
| =1 if heard about climate change | 0.71 | -0.01 | 0.01 | -0.01 |
| | | (0.02) | (0.02) | (0.02) |
| Climate change impact on Liberia (1-5, 5=very negative) | 3.46 | -0.02 | -0.13* | 0.10 |
| | (1.46) | (0.07) | (0.08) | (0.08) |
| Concerned about drought, flood, etc. (1-5, 5=very concerned) | 4.50 | -0.10* | 0.04 | 0.10** |
| | (0.98) | (0.05) | (0.05) | (0.05) |
| Role of ordinary Liberians (1-5, 5=very important) | 3.81 | -0.11 | 0.04 | 0.10 |
| | (1.46) | (0.08) | (0.07) | (0.07) |
| Imminent government action (1-5, 5=very important) | 4.25 | 0.01 | -0.01 | 0.06 |
| | (1.27) | (0.06) | (0.06) | (0.06) |
| =1 if thinks gov't has primary responsibility | 0.74 | 0.02 | -0.01 | 0.01 |
| | | (0.02) | (0.02) | (0.02) |
| =1 if knew about Blue Carbon | 0.08 | | | |
| Observations | 538 | 518 | 490 | 501 |

Note: Column 1 presents the mean and standard deviations for the control group; Columns 2-4 report the differences between each treatment group and control group and the standard errors in parentheses.

# 5 Results

## 5.1 Primary Outcomes

Once the respondents were presented with the narratives that framed the carbon offsetting projects in either positive or negative terms, we asked three sets of questions to measure our primary outcomes: (1) perceptions on carbon offsetting, (2) views on government role, and (3) perceptions on global climate action. The outcome variables were measured on a 1-5 scale, where 1 indicated the lowest level of support and 5 indicated the highest level of support.

Table 2 presents the mean values for these outcomes in the control group, which received only the common narrative. First, we notice that respondents typically has high levels of optimism *as well as* concerns about carbon offsetting projects: when asked about their perceived benefit or concerns, respondents, on average, rated 4.43 and 4.23 out of 5, respectively.[8] In addition, many respondents agreed that green technologies are important to address climate change, with an average rating of 4.51.[9] Second, somewhat to the contrary to the responses to the questions regarding perceptions on carbon offsetting, the responses to the questions on the views on government role were closer to being ambivalent. When asked, for instance, "[h]ow much do you support the government's involvement in carbon offsetting projects, like letting foreign companies manage our forests for carbon credits?", the average response was 4.08.[10] The average responses to the questions about respondents' trust in the government's ability to handle environmental issues or policies on agriculture and forestry were even lower at 3.40 and 3.13, respectively.[11] Finally, while respondents agree that climate change is a world-

[8]The full wordings for these questions were as follows: "Do you think carbon offsetting projects will bring good investments and help protect our environment?" and "How worried are you about local communities losing their homes and land rights because of carbon offsetting projects?". The response options went from "Very harmful" (1) to "Very beneficial" (5) in the former, and "Not at all concerned" (1) to "Very concerned" (5) in the latter.

[9]"How important is it for countries like ours to get new, green technologies to help with climate change?", with response options from "Not at all important" (1) to "Very important" (5).

[10]The response options were from "Strongly Oppose" (1) to "Strongly Support" (5).

[11]The full wordings for these questions were as follows: "[h]ow much trust do you have in our government's ability to effectively handle environmental issues?" and "Some people think the government shouldn't make

wide problem that needs countries to work together (mean of 4.78), they are less optimistic about international organizations' ability to deal with climate change, with an average rating of 3.67.[12]

Table 2: Perceptions on Climate Actions (Control Group only)

| | (1) Mean | (2) SD |
|---|---|---|
| **Perceptions on carbon offsetting** | | |
| 1. Perceived benefit of carbon offsetting | 4.43 | (1.04) |
| 2. Perceived concern about carbon offsetting | 4.23 | (1.21) |
| 3. Importance of green technology | 4.51 | (0.73) |
| **Views on government role** | | |
| 4. Support for government | 4.08 | (1.48) |
| 5. Trust in government | 3.40 | (1.50) |
| 6. Government policies on agriculture & forestry | 3.13 | (1.75) |
| **Perceptions on global climate action** | | |
| 7. Effectiveness of international organizations' efforts | 3.62 | (1.21) |
| 8. Need for global cooperation | 4.78 | (0.69) |
| Observations | 538 | |

Note: 1-5 scale, where 1=lowest and 5=highest.

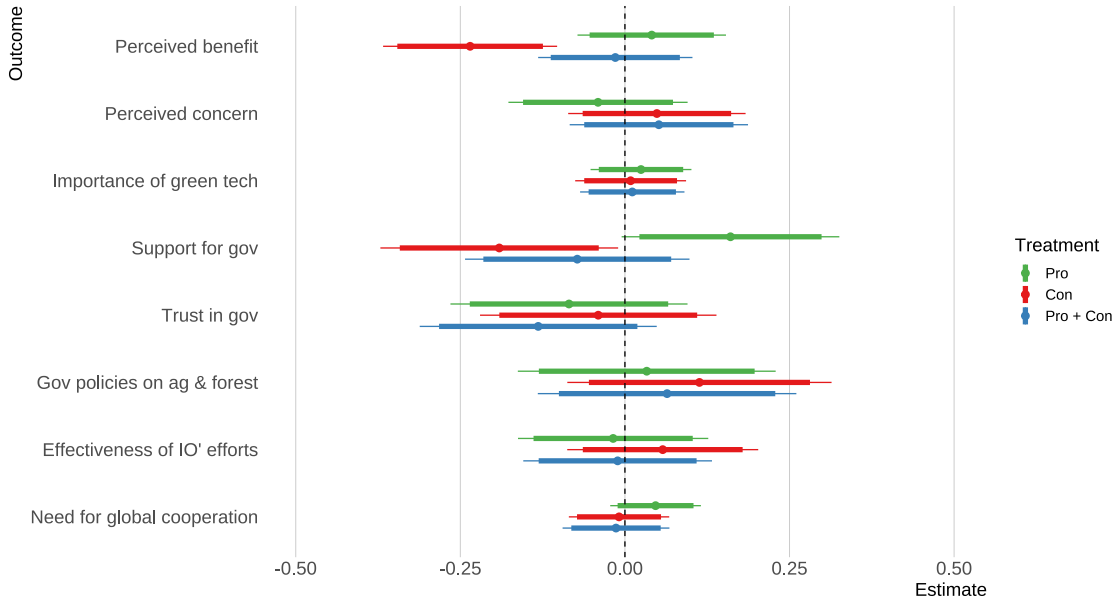
Next, we examine the effects of the positive and negative narratives on respondents' perceptions of carbon offsetting projects. We estimate the average treatment effects of the positive and negative narratives on the primary outcomes using a series of ordinary least squares (OLS) regression models. The results are presented in Figure 2. The x-axis shows the average treatment effects of the positive and negative narratives on the primary outcomes, while the y-axis shows the primary outcomes being examined. The thicker bar indicates 90% confidence intervals, and the narrower bar indicates 95% confidence intervals.

policies that hurt jobs in agriculture and forestry, like rubber, cocoa, coffee, palm oil, rice, cassava, maize, and others, because it could harm the workers' identities and their communities connected to forests and land. Do you agree?"

[12]The full wordings for these questions were as follows: "How well do you think international organizations are dealing with climate change?" and "Do you agree that climate change is a worldwide problem that needs countries to work together?". The response options were from "Very ineffective" (1) to "Very effective" (5) in the former, and from "Strongly disagree" (1) to "Strongly agree" (5) in the latter.

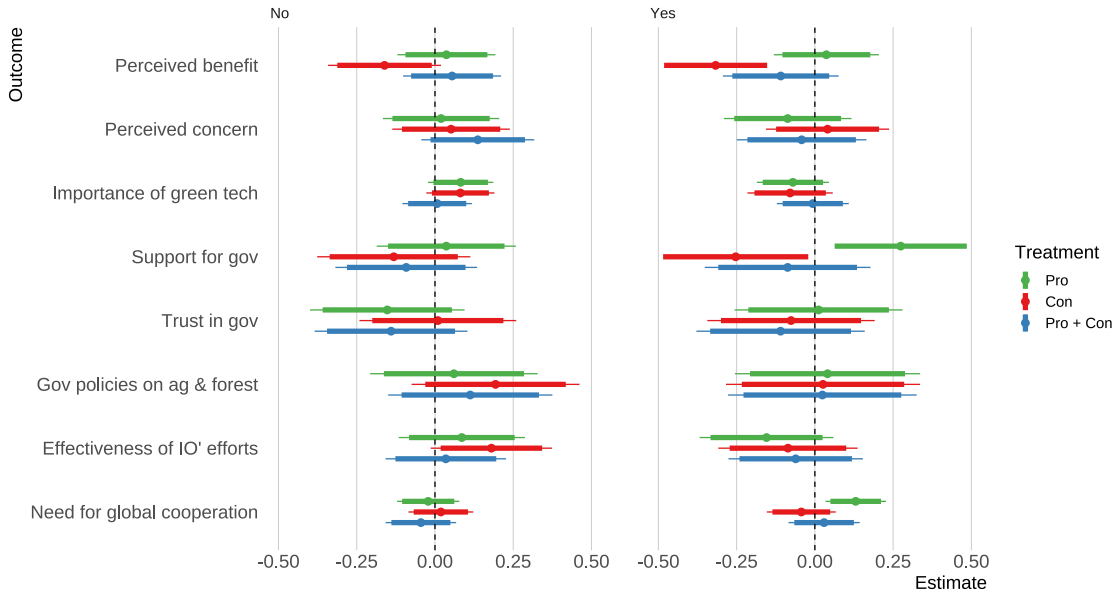
First, we see that the positive framing does not yield any statistically significant results in any of our specifications, although the effect size for the *Support for Government* outcome barely misses to pass the threshold for the 95 % confidence level. On the other hand, the negative framing has statistically significant negative effects on both the *Perceived Benefits* and *Support for Government* outcomes at the 95% level. Finally, the combined treatment has no significant effect on any of the outcomes. These findings, especially for the *Support for Government* outcome, are broadly consistent with our expectation regarding the *framing effects*: positive information increases public support for carbon offsetting projects, whereas negative information decreases it, and the combination of both cancels out the effects of one another. Yet, we also notice that the effects on the perceived benefits or concerns are asymmetric, at best: while the negative information significantly decreases the perceived benefits, the positive information does not significantly increase the concerns.

Figure 2: Framing Effects on Perceptions on Carbon Offsetting



Next, we turn to testing our hypothesis on *interest-driven reasoning* by examining the heterogeneous treatment effects depending on whether the respondents have any personal ties to the forestry-related industries. The results, shown in Figure 3, are generally consistent with the prior literature on interest-driven reasoning. First, on the left-hand side panel depicting the average treatment effects with those without forestry ties, we see that while most of the treatment effects are not statistically significant, there are some statistically significant effects for the negative treatment on the *Perceived benefit* and *Effectiveness of IO's effrots* outcomes, though at the 90% level. In contrast, on the right-hand side panel for those with forestry ties, we see that the negative treatment has a significant negative effect on the *Perceived benefit* and *Support for government* outcomes, while the positive treatment has a significant positive effect on the *Support for government* and *Need for global cooperation* outcomes, all at the 95% confidence level and with larger magnitude of effects compared to the pooled analysis in Figure 2. These broadly partially confirms our expectation regarding the *interest-driven reasoning*: among those with forestry ties, while the information about carbon offsetting projects do not seem to affect respondents' perceptions about the perceived concerns, the negative impact of the negative information is more pronounced for both the *Perceived benefit* and *Support for government* outcomes, and the positive impact of the positive information is more pronounced *Support for government* outcome. Here, it is important to note that (1) we do not specify how the benefits of the carbon offsetting projects will be distributed within the country in our treatment information, and (2) our sample does not include the rainforest communities that will be directly affected by the government policy. As such, we speculate that the effect sizes we observed are conservative estimates at best and could have been even larger, had we provided more targeted information about the distributional consequences and/or direclty included the rainforest communities in our sample.

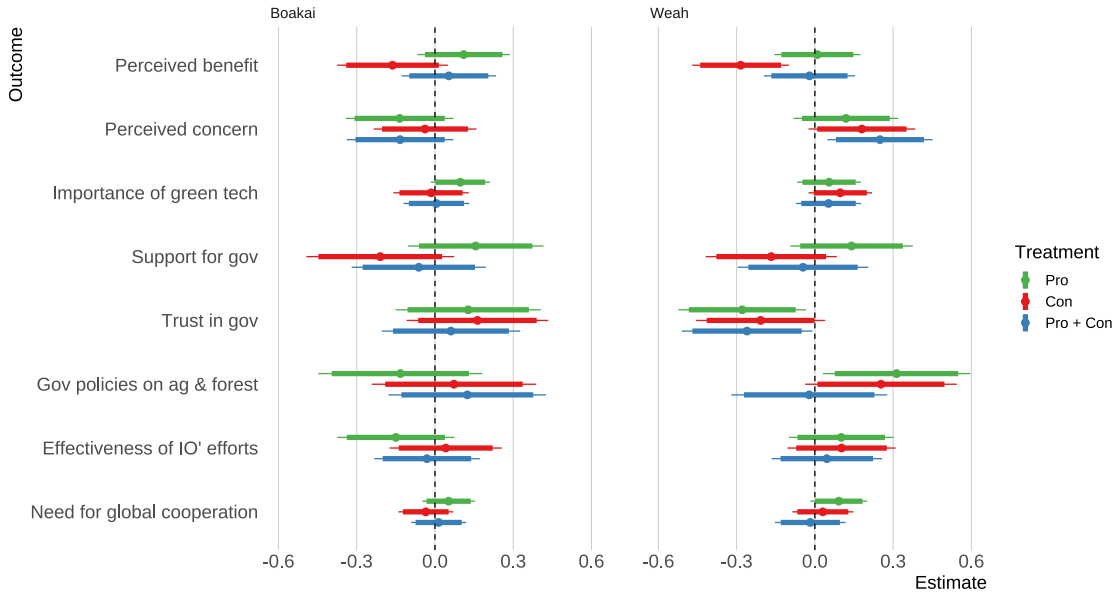
Figure 3: Heterogeneity by Personal Ties to Forestry-related Industries




Turning to the rests for our test of *politically motivated reasoning*, we examine the heterogeneous treatment effects depending on whether the respondents support the incumbent president. The results, shown in Figure 4, do not provide a clear support for our expectation regarding the *Motivated Reasoning*. On th left-hand side panel with the incumebent president – Joseph Boakai – supporters, while we would expect that the positive information treatment increases the public support for the government's carbon offsetting policy only among the supporters of the incumbent president under the *Motivated Reasoning* hypothesis, we find that none of the treatment information yield any statistically significant effects. In contrast, among the supporters of the challenger and former president – George Weah – on the right-hand side panel, we see that the negative information treatment significantly deceases the positive perceptions about the carbon offsetting project (*Perceived benefit*), while significantly increasing the concerns about the project (*Perceived concern*). Notably, while positive information

treatment does not have any significant effects on these outcomes, the *Perceived concern* even increases when the respondents are presented with both the positive and negative information. Interestingly, none of the treatment information has any significant effects on the *Support for government* outcome, but regardless of which treatment the respondents saw, the supporters of the opposition, George Weah, shows lower trust in government's ability to handle environmental issues or policies on agriculture and forestry compared to the control group. These results suggest that the *Motivated Reasoning* hypothesis does not hold in our context across the different outcomes, and the effects of the treatment information are more pronounced among the supporters of the opposition, George Weah, compared to the supporters of the incumbent president, Joseph Boakai.

Figure 4: Heterogeneity by Support for Incumbent President



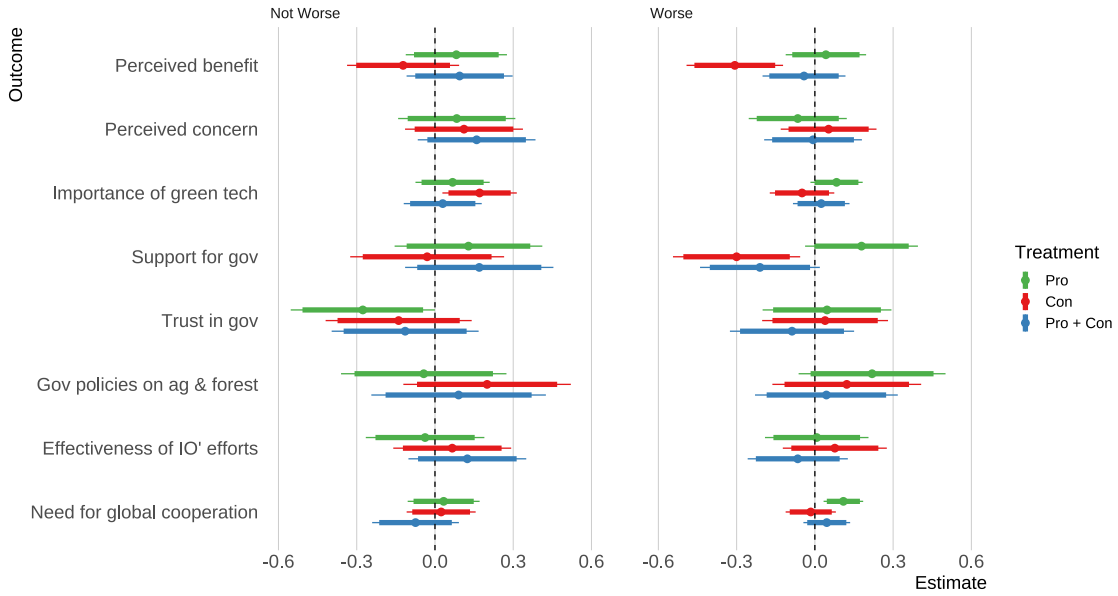

Finally, we test our hypothesis regarding *Prior knowledge* by examining the heterogenerous treatment effects across respondents with different levels of concerns about climate change.[13]

[13]The full wordings were, "Do you think climate change is making life in Liberia better or worse, or haven't you

The results, shown in Figure 5, do not provide a clear support for our expectation. On the left-hand side panel with the respondents who think climate change is making life in Liberia better or about the same, we see that the treatment information does not systematically affect the outcomes in the directions that we expected: if anything, the negative information treatment increases the emphasis on the importance of green technology in tackling climate change (*Need for green tech*). In contrast, among the respondents who think climate change is making life in Liberia much or somewhat worse, we see that the negative information treatment significantly decreases the positive perceptions about the carbon offsetting project (*Perceived benefit*) and the *Support for government*. Notably, while none of the treatment treatment information have any significant effects on the *Perceived concern* outcome, those receiving positive information were much more likely to agree that climate change is a worldwide problem that needs countries to work together (*Need for global cooperation*).

heard enough to say?" with the response options: Much better / somewhat better / Neither - no change - about the same / Somewhat worse / Much worse.

Figure 5: Heterogeneity by Awareness of Climate Change




## 6 Conclusion

Our study examined the public support for carbon offsetting projects in Liberia, highlighting the complex interplay of information framing, personal interests, political affiliations, and prior knowledge. The findings reveal that negative framing about the potential harms of carbon offsetting projects significantly reduces public support, particularly among those with personal ties to forest communities. This aligns with the broader literature on interest-driven reasoning, suggesting that individuals are more likely to oppose policies that could adversely affect their communities, even when framed with positive economic and environmental narratives. Interestingly, the effects of positive information on increasing support were less pronounced, and when both positive and negative narratives were presented together, they tended to neutralize each other, resulting in no significant change in support levels. This outcome underscores the challenges in effectively communicating the benefits of carbon offsetting projects in con-

texts where skepticism and concern over local impacts are deeply ingrained. Our analysis also explored politically motivated reasoning, but the results did not fully support the hypothesis that support would vary significantly based on ethnic or political affiliations. While opposition supporters reacted more strongly to negative framing, the anticipated positive response among copartisan groups was not as robust as expected. This suggests that in the Liberian context, political identities may not uniformly influence opinions on environmental issues as they do in other policy areas. Finally, prior knowledge about climate change played a moderating role in shaping public perceptions. Those with greater awareness of climate change were more resistant to framing effects, particularly in terms of increasing support for global cooperation and green technologies. This indicates that informational interventions could potentially mitigate some of the negative perceptions associated with carbon offsetting projects.

In conclusion, our study contributes to the growing body of literature on public opinion regarding climate change mitigation in the Global South. The findings emphasize the importance of carefully considering local contexts, especially the material and social interests of communities, when designing and communicating environmental policies. Policymakers and international organizations must ensure that the implementation of carbon offsetting projects is both equitable and transparent, addressing the legitimate concerns of affected populations to foster broader and more sustainable public support. Future research should continue to investigate the nuanced dynamics of public opinion in different political and cultural settings, particularly in developing countries where climate policies intersect with complex socio-economic realities. Understanding these dynamics is crucial for the success of global climate action, as it depends on the willingness and support of local populations in host countries like Liberia.

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## Appendix A. Additional Results

Table A1: Framing Effects on Perceptions on Carbon Offsetting

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Perceived benefit | Perceived concern | Importance of green tech | Support for gov't | Trust in gov't | Gov't policies on ag & forest | Effectiveness of IO's efforts | Need for global cooperation |
| Pro | 0.05 | -0.00 | 0.05 | 0.14 | -0.08 | 0.11 | -0.03 | 0.07* |
| | (0.06) | (0.07) | (0.04) | (0.09) | (0.09) | (0.11) | (0.08) | (0.04) |
| Con | -0.22*** | 0.07 | 0.05 | -0.19* | -0.05 | 0.17 | 0.06 | -0.00 |
| | (0.07) | (0.07) | (0.05) | (0.10) | (0.09) | (0.11) | (0.08) | (0.04) |
| Pro + Con | 0.02 | 0.04 | 0.03 | -0.05 | -0.10 | 0.05 | -0.00 | -0.01 |
| | (0.06) | (0.07) | (0.05) | (0.09) | (0.09) | (0.11) | (0.07) | (0.04) |
| Control mean | 4.43 | 4.23 | 4.51 | 4.08 | 3.40 | 3.13 | 3.62 | 4.78 |
| Control SD | 1.04 | 1.21 | 0.73 | 1.48 | 1.50 | 1.75 | 1.21 | 0.69 |
| Observations | 2,045 | 2,046 | 2,044 | 2,044 | 2,039 | 2,034 | 2,043 | 2,041 |

Note: Outcome variable is on a 1-5 scale, where 1=lowest and 5=highest. Robust standard errors in parentheses. ***, **, and * represent significance at 1%, 5%, and 10%, respectively.

Table A2: Heterogeneity by Personal Ties to Forestry-related Industries

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Perceived benefit | Perceived concern | Importance of green tech | Support for gov't | Trust in gov't | Gov't policies on ag & forest | Effectiveness of IO's efforts | Need for global cooperation |
| **Panel A. Personal ties to forestry-related industries** | | | | | | | | |
| Pro | -0.02 | -0.08 | -0.02 | 0.20 | -0.01 | 0.19 | -0.17 | 0.11** |
| | (0.09) | (0.11) | (0.06) | (0.13) | (0.14) | (0.16) | (0.11) | (0.05) |
| Con | -0.33*** | 0.09 | -0.05 | -0.28** | -0.11 | 0.18 | -0.08 | -0.04 |
| | (0.10) | (0.10) | (0.07) | (0.14) | (0.13) | (0.16) | (0.11) | (0.06) |
| Pro + Con | -0.10 | -0.07 | 0.04 | -0.08 | -0.05 | 0.07 | -0.05 | 0.04 |
| | (0.10) | (0.11) | (0.06) | (0.14) | (0.14) | (0.17) | (0.11) | (0.06) |
| Control mean | 4.50 | 4.31 | 4.60 | 4.08 | 3.38 | 3.17 | 3.73 | 4.80 |
| Control SD | 1.02 | 1.15 | 0.62 | 1.50 | 1.49 | 1.80 | 1.20 | 0.65 |
| Observations | 935 | 936 | 935 | 934 | 935 | 931 | 934 | 936 |
| **Panel B. No personal ties** | | | | | | | | |
| Pro | 0.11 | 0.07 | 0.11* | 0.10 | -0.15 | 0.04 | 0.10 | 0.03 |
| | (0.09) | (0.10) | (0.06) | (0.12) | (0.13) | (0.14) | (0.10) | (0.06) |
| Con | -0.13 | 0.05 | 0.14** | -0.10 | 0.00 | 0.16 | 0.18* | 0.03 |
| | (0.10) | (0.10) | (0.06) | (0.13) | (0.13) | (0.15) | (0.10) | (0.06) |
| Pro + Con | 0.11 | 0.14 | 0.03 | -0.02 | -0.14 | 0.03 | 0.05 | -0.04 |
| | (0.08) | (0.10) | (0.06) | (0.12) | (0.13) | (0.14) | (0.10) | (0.06) |
| Control mean | 4.37 | 4.17 | 4.44 | 4.08 | 3.42 | 3.10 | 3.52 | 4.77 |
| Control SD | 1.06 | 1.25 | 0.81 | 1.47 | 1.51 | 1.71 | 1.22 | 0.72 |
| Observations | 1,110 | 1,110 | 1,109 | 1,110 | 1,104 | 1,103 | 1,109 | 1,105 |

Note: Outcome variable is on a 1-5 scale, where 1=lowest and 5=highest. Robust standard errors in parentheses. ***, **, and * represent significance at 1%, 5%, and 10%, respectively.