EBA

02

2025

LAND TENURE AND CLIMATE RESILIENCE: HOUSEHOLD LEVEL EVIDENCE FROM KENYA

Kathleen Klaus, Emma Elfversson

Land Tenure and Climate Resilience: Household Level Evidence from Kenya

Kathleen Klaus,

Emma Elfversson

Report 2025:02

to

The Expert Group for Aid Studies (EBA)

Kathleen Klaus is Associate senior lecturer and Assistant Professor at the Department of Peace and Conflict at Uppsala University, Sweden. During 2024–25 she is visiting scholar at the Political Science Department at UC Berkeley, USA.

Emma Elfversson is Associate senior lecturer and Assistant Professor at the Department of Government at Uppsala University, Sweden. She is also researcher at the Conflicting Objectives Research Nexus at the same university.

Please refer to the present report as: Klaus K. and E. Elfversson (2025), *Land Tenure and Climate Resilience: Household Level Evidence from Kenya*, EBA Report 2025:02, The Expert Group for Aid Studies (EBA), Sweden.

This report can be downloaded free of charge at www.eba.se

ISBN 978-91-988281-6-0 (printed edition), 978-91-988281-7-7 (web edition)
Printed by Elanders Sverige AB
Stockholm 2025

Cover design by Julia Demchenko

Acknowledgements

We are grateful for constructive feedback on earlier versions of this study from the EBA reference group: Catherine Boone, Mats Hårsmar, Fibian Lukalo, Christian Lund, Margareta Nilsson, and Johan Schaar; participants in the Development Research Seminar at Uppsala University; and the Nordic Climate Network workshop. We also gratefully acknowledge the excellent work of Abel Oyuke and the entire survey team at IPOR-Kenya, and excellent research assistance by Hillary Ogina and Rebecca Munga, who facilitated our qualitative data collection in Laikipia and Mombasa. Finally, we are grateful to all the Kenyans who took the time to answer our survey or participate in our focus group interviews. We hope that this report goes some way towards helping to highlight some of the important concerns about climate change and adaptation you have raised.

Table of Contents

Annexes 4–10 are available online: eba.se/en/reports/land-tenure-and-climate-resilience

Foreword by EBA

Land is a key asset in countries where majorities are dependent on natural resources for their livelihoods. In such situations control over land means power. Hence, in most low- and lower middle-income countries land issues rank high on political agendas. Land tenure is a highly contentious issue in many countries on the African continent, at times the most contested of all.

To be dependent on natural resources for livelihoods requires great flexibility. Cultivation conditions change with weather, climate and other natural hazards. Adapted mitigation strategies become necessary for dealing with both long and short term variations. This makes it even more important to have control over land as a main production factor and livelihood precondition.

In countries with large natural resource based sectors, land tenure issues are also key for the whole economy, as a factor that may impact both production and productivity. The legitimacy and strength of land rights influences what investments that are undertaken.

As climate change unfolds, it has for some time been clear that land use, and control over land, is an essential precondition also for what kind of climate adaptation individuals and societies may undertake. For instance, the UN research panel IPCC has underlined this in several of its reports.

However, solutions are all too often formulated in terms of cadastral surveys, formalisation or privatisation of land rights. These are said to be preconditions for secure land rights. Besides being simplistic in analysis, such solutions often result in increasing land conflicts as several tenure systems become superimposed over one another. Much more granular analyses of what makes land rights secure in various situations are needed.

It is from this vantage point that the current study starts. It focuses on Kenya – a country known for its proactive approach to climate policies, but also a country where many forms of land rights coexist. The authors clearly show the intriguing character of land rights in this setting. They point to the need to understand not only land tenure system characteristics, but also the strength of land rights, as well as how land right strength is perceived by various actors.

Even as details may be specific for the Kenyan case, the analytical approach – with its different elements – is highly relevant for other countries and situations where different kinds of land rights coexist. What the authors furthermore show is how various strengths and forms of land rights correlate with various forms of climate adaptation.

Such an approach to land rights is of relevance for Swedish aid programs in support of climate adaptation, but also for other programs and interventions in support of e.g. agriculture, pastoralism, forestry or housing.

We hope this study will be of value to those working with policies and interventions in support of climate adaptation in low- and lower middle income countries. Among these may be policymakers and staff at the Swedish MFA, embassies and Sida, as well as actors in the private sector and in civil society. The study has been accompanied by a reference group led by Johan Schaar, former deputy chair of EBA.

The authors are solely responsible for the content of the report.

Stockholm and Malmö, June 2025

Torbjörn Becker Johan Schaar

Sammanfattning

I stora delar av världen bygger ekonomiskt välstånd, identitet och makt på tillgång till mark. Kontroll över mark påverkar den politiska och sociala ordningen, den kan orsaka konflikter, påverka bosättning och migration och den påverkar även ojämlikhet och utslagning.

Klimatförändringar påverkar på ett genomgripande sätt hur befolkningar använder och interagerar med mark. Jordbrukare måste fatta svåra beslut om investeringar i ny teknik eller kanske om att överge jordbruket helt och hållet. Boskapsskötare måste söka alternativa betesmarker – vilket ofta leder till konflikter med bofasta jordbrukare eller andra markägare.

I kuststäder leder höjning av havsnivåer till översvämningar och erosion. Det innebär i sin tur att människor, särskilt de fattiga, förflyttas, att värdet på mark stiger och att ojämlikheter förvärras. Sammantaget hotar den minskande tillgången på mark - oavsett om det gäller bostäder och stadsutveckling, jordbruk eller boskap – möjligheterna till försörjning. Konkurrens intensifieras och tvister mellan markanvändare underblåses. Dåligt definierade, svagt genomförda eller starkt politiserade regler för markägande kan förvärra dessa spänningar och hindra en effektiv anpassning till klimatförändringarna, särskilt i fattiga och marginaliserade samhällen.

Denna rapport fokuserar på frågan om markägande – de normer och regler som styr en persons rätt till mark – och frågar hur det påverkar de vardagsstrategier som människor använder för att mildra klimatrelaterade hot. Att förstå hur markägande formar vardagliga strategier för klimatanpassning är viktigt för de beslutsfattare och utvecklingsaktörer som arbetar med att utforma hållbara, lokalt förankrade strategier för motståndskraft.

Vi undersöker denna fråga i Kenya. Trots att den kenyanska regeringen tagit på sig en ledarroll i övergången till grön ekonomi, särskilt genom att investera i förnybar energi (CSIS 2025), är landet fortfarande mycket sårbart för klimatförändringar. Denna sårbarhet

beror inte bara på ekologisk sårbarhet utan även på ett utbrett markberoende – 71 procent av landsbygdsbefolkningen är beroende av jordbruk och över nio miljoner människor är beroende av boskapsskötsel. Situationen förvärras av en markpolitik som historiskt har lett till att åkermark har koncentrerats till ett fåtal eliter, med ojämlikt besittningsskydd som följd (Kameri-Mbote, 2016; Kenyas regering, 2004).

För att studera om och hur markinnehav påverkar vanliga kenyaners strategier för klimatresiliens, använder vi oss av en hushållsenkät med 1000 respondenter. Den har genomförts i två kenyanska län, ett som främst präglas av landsbygd och halvtorrt klimat (Laikipia) och ett som främst är urbant och kustnära (Mombasa). Vi kompletterar undersökningsresultaten med fokusgrupps-diskussioner i båda länen.

Denna rapport skiljer sig från tidigare studier fokuserade på mark och klimatanpassning på två viktiga sätt. För det första: i stället för att enbart fråga om markinnehav förutsäger om ett hushåll klimatanpassar sig eller inte, överväger vi en rad möjliga svar. Mer specifikt undersöker vi hur markinnehav påverkar sannolikheten för att människor kommer att:

- engagera sig i klimatanpassning på hushålls- eller samhällsnivå,
- organisera sig kollektivt för att kräva politisk förändring, eller
- stödja våldsamma eller tvingande strategier för att återta eller försvara mark från andra.

För det andra: medan flera studier diskuterar markägande i binära termer (t.ex. stark eller svag eller formell eller informell), introducerar vi en mätstrategi i tre dimensioner: ägandesystemet, styrkan och omfattningen av formella rättigheter och individers upplevda ägandesäkerhet. Genom att beakta dessa tre dimensioner kan beslutsfattare få ytterligare insikter i hur markägande formar, uppmuntrar eller avskräcker proaktiva strategier av klimatanpassning.

Huvudsakliga resultat

I stort konstaterar rapporten att olika dimensioner av markägande är viktiga för att förklara de strategier för klimatanpassning och motståndskraft som människor stöder eller följer. De viktigaste slutsatserna i rapporten är följande:

1. De flesta Kenyaner ser klimatförändringar som ett hot, men det finns skillnader mellan olika regioner

I såväl städer som på landsbygd känner kenyanerna igen effekterna av klimatförändringarna i sitt dagliga liv, även om arten av dessa hot varierar beroende på region och vad man försörjer sig på. I det kustnära och urbana länet Mombasa är översvämningar det främsta problemet, särskilt eftersom snabb urbanisering, trängsel och otillräcklig infrastruktur för dränering förvärrar sårbarheten. I det torrare inlandslänet Laikipia, där invånarna är beroende av jordbruk och boskapsskötsel, uppgav 60 procent av de tillfrågade att de drabbats allvarligt av torka under de senaste två, tre åren.

Typen av försörjning bidrar till att förklara vilka typer av motståndskraftsstrategier som människor följer. Till exempel är boskapsskötande hushåll särskilt benägna att engagera sig i anpassningsinsatser både på hushålls- och samhällsnivå. Det kan handla om att gå över till boskap som är mer tålig mot torka, att spara på vatten och betesmark, att investera i infrastruktur eller att plantera träd. Men även om de vardagliga utmaningarna med extremt väder varierar mellan olika försörjningsformer och stads- och landsbygdsområden, är skillnader i markägande en betydande och ibland viktigare faktor för att förklara människors reaktioner på klimatförändringarna, vilket vi förklarar i de efterföljande resultaten.

2. Olika system för markägande främjar kollektiv respektive individuell anpassning

Besittningssystemet – om marken är kommunal, privat eller offentlig – påverkar om människor följer individuella eller kollektiva klimatanpassningsstrategier. Människor som bor på kommunal och offentlig mark är mer benägna att engagera sig i kollektiva insatser för resiliens, som till exempel betesförvaltning och vattenskydd. I boskapsskötande områden i Laikipia bidrar gemensamma strukturer för markförvaltning till att samordna betesförvaltning och insatser för att mildra torka. Däremot är privat markägande oftare förknippat med individuella anpassningsstrategier, till exempel anpassning av bostäder eller övergång till boskap med bättre motståndskraft mot torka.

3. Starka markrättigheter uppmuntrar till investeringar i klimatanpassningsåtgärder och politiskt påverkansarbete

Personer med starka markrättigheter – mätt genom äganderätt och ett markrättighetsindex (LRI) – är mer benägna att investera i klimatanpassning och engagera sig i politiskt påverkansarbete än personer med svag eller osäker äganderätt till mark. Framför allt är människor med starka rättigheter mer benägna att investera i motståndskraftsförbättrande uppgraderingar av sina hem och sitt samhälle. Dessutom är personer med starka markrättigheter mer benägna att delta i protester och andra insatser som syftar till att förbättra miljöskyddet. Deltagare i fokusgrupper i Laikipia och Mombasa beskrev till exempel att markägare – snarare än hyresgäster – har större förtroende för att samarbeta med myndigheter för att kräva klimatrelaterade insatser.

4. Osäkra besittningsformer kan stärka stödet för våld och motverka anpassning, samtidigt som det motiverar till politiska åtgärder

Människor som saknar besittningsskydd – de som är rädda för att bli vräkta eller förlora sin mark – är mindre benägna att investera i anpassningsstrategier och mer benägna att stödja våld. I synnerhet är personer som fruktar vräkning mer öppna för att ta till våld som ett sätt att skydda sina försörjningsmöjligheter. Personer med lagfart är däremot mer benägna att ta avstånd från sådant våld. I Laikipia beskriver boskapsskötare hur torka leder till att vissa människor låter sin boskap beta på stora farmer eller privata gårdar. Dessa rörelser kan leda till sammandrabbningar mellan boskapsskötare och privata markägare eller statliga säkerhetsstyrkor.

Vissa respondenter betonade också behovet av att ta till vapen för självförsvar i situationer där banditer, boskapsplundring och betes-konflikter är vanliga. I fokusgrupperna i Mombasa framgick det hur omtvistade markanspråk, tvångsvräkningar och historisk äganderätt driver fram politiska protester och i vissa fall konflikter. Men även om osäkra besittningsförhållanden kan öka stödet för våld och minska incitamenten att investera i klimatanpassningsåtgärder, är människor med osäkra besittningsförhållanden mer benägna än de med säkra besittningsförhållanden att mobilisera sig politiskt för att uttrycka klimatrelaterade farhågor.

5. Förtroendet för institutioner påverkar hur starkt besittningsskyddet upplevs vara

Det finns många faktorer som påverkar besittningsskyddet, men förtroendet för institutioner – formella eller informella – spelar en viktig roll. Även om formella system för markdokumentation kan bidra till att förbättra den upplevda säkerheten, förbättras säkerheten endast om människor litar på att deras rättigheter kommer att erkännas och upprätthållas av både andra samhällsaktörer och staten.

I Laikipia uttryckte deltagarna i fokusgrupperna förtroende för lokala myndigheter och kollektiva markförvaltningsstrukturer, vilket stärkte deras besittningsskydd.

Däremot beskrev respondenterna i Mombasa en utbredd misstro mot myndigheter, med hänvisning till korruption, oklara regler och rättslig osäkerhet. Undersökningsresultaten bekräftar denna klyfta: medan 70 procent av invånarna i Laikipia tror att lokala myndigheter kommer att skydda deras markrättigheter, har endast 44 procent i Mombasa samma förtroende. Dessa resultat belyser vikten av transparenta och ansvarsfulla system för markförvaltning för att stärka besittningsskyddet och i förlängningen klimatresiliensen.

6. Könsskillnader i markägande begränsar kvinnors strategier för motståndskraft mot klimatförändringar

Kvinnor i Kenya möter fortsatt strukturella hinder kring markägande och besittningsskydd, vilket begränsar deras möjligheter att engagera sig i klimatanpassning. Kvinnorna i studien var mindre benägna att inneha äganderättshandlingar, mer benägna att frukta vräkning och mindre engagerade i anpassningsinsatser både på hushålls- och samhällsnivå. Även inom grupper med formella markrättigheter var kvinnors deltagande lägre i klimatåtgärder, till exempel vad gäller att införa klimatsmarta jordbruksmetoder eller att delta i gemensamma bevarandeinsatser. Dessa mönster tyder på att vid sidan av en osäker besittningsrätt så begränsar även bredare ekonomiska och sociala hinder – såsom begränsad tillgång till kredit, mindre inflytande över viktiga beslut och strukturer – kvinnors förmåga att vidta proaktiva åtgärder för att bygga motståndskraft.

Viktiga lärdomar för beslutsfattare

Sammantaget belyser vår studie de olika sätt på vilka markägande kan forma hur människor reagerar på klimatrelaterade hot. Vi pekar på tre viktiga mekanismer som kan bidra till att förklara våra resultat. I synnerhet föreslår vi att variationer i de regler och normer som formar hur människor får tillgång till och säkrar rättigheter till mark har konsekvenser för klimatmotståndskraften i den mån de: (a) formar uppfattningar om makt och handlingskraft, (b) påverkar kollektiv handlingskapacitet och (c) aktiverar klagomål.

a) Handlingskraft och makt: För det första, när människor har säkra markrättigheter tenderar de att känna större kontroll över sin framtid. Minskad osäkerhet uppmuntrar till långsiktiga investeringar i klimatanpassning. Människor med svaga eller osäkra markrättigheter tvekar däremot ofta inför sådana investeringar, eftersom de är rädda att bli fördrivna eller förlora sin mark. Dessutom saknar människor utan besittningsskydd ofta också social eller ekonomisk makt att göra sådana investeringar, även om de skulle vilja.

b) Förmåga till kollektivt handlande: Hur marken ägs och styrs påverkar hur människor organiserar sig för att förbättra sin motståndskraft mot klimatförändringar. I Kenya fann vi att gemensam förvaltning förstärker gemensamma anpassningsinsatser på kollektiva och offentliga markområden, medan privat markägande oftare förknippas med individuellt beslutsfattande. Olika förvaltningsformer påverkar huruvida strategier för klimatresiliens bedrivs kollektivt eller individuellt.

c) Aktivering av missnöje: En upplevd osäkerhet i fråga om besittningsrätt kan ge upphov till missnöje, särskilt när människor känner sig utestängda från mark eller riskerar att förlora sin egendom. I vissa fall leder sådana klagomål till politisk mobilisering eller till konflikter, särskilt i sammanhang där markägandet redan är omtvistat.

Var och en av dessa faktorer får stora konsekvenser för förståelsen av hur olika grupper hanterar klimatrisker, får tillgång till resurser och samarbetar med både statliga och icke-statliga aktörer i sina anpassningsinsatser. Det är inte bara individuella samarbeten och institutionellt förtroende som påverkas. Utifrån våra resultat identifierar vi en rad viktiga områden för beslutsfattare att ta hänsyn till i utformningen av stöd till lokalsamhällen i deras ansträngningar att bli mer motståndskraftiga mot klimatförändringar.

1. Beakta både formell och upplevd markägarsäkerhet i klimatanpassningspolitiken

Beslutsfattare bör ta hänsyn till både formella och upplevda aspekter av markägande när de utformar insatser. Som denna rapport visar är formellt besittningsskydd inte alltid det samma som upplevd säkerhet. Politiska åtgärder som endast fokuserar på formella markrättigheter riskerar att förbise viktiga sociala och politiska dynamiker som kan undergräva besittningsskyddet. Med tanke på att markrättigheter kan ha sin bas antingen i formella eller informella institutioner, visar våra resultat att hushåll och samhällen har bäst förutsättningar att engagera sig i kooperativa och långsiktiga anpassningsstrategier när de åtnjuter både starka besittningsrättigheter (t.ex. lagfart eller skriftligt dokument från regeringen i fallet Kenya) och litar på att deras rättigheter kommer att erkännas och skyddas i framtiden (upplevt besittningsskydd).

2. Utgå från dynamiken i markägandet i strategier för klimatresiliens

Beslutsfattare bör vara medvetna om att markägande påverkar klimatresiliens inte enbart genom att ge tillgång till mark som resurs, utan också genom att det formar uppfattningar om vilket utrymme som finns för enskilt och kollektivt handlande och för klagomål. Förståelse för dessa mekanismer är avgörande för utformandet av en

effektiv klimatanpassningspolitik. Politiken bör vara anpassad till lokal markförvaltning, hantera sociala spänningar och stärka förtroendet för institutioner.

Till exempel kan strategier som stärker säkerheten i markrättigheter leda till fler långsiktiga investeringar i anpassning, och stärkta kooperativa strukturer för markförvaltning kan uppmuntra till kollektiva insatser för ökad resiliens. Man kan även bidra till att förhindra tvister, vilka skulle kunna eskalera till konflikter, genom att tidigt uppmärksamma markrelaterade klagomål och hantera osäkerheter i besittningsrätten när klimatanpassningsprogram planeras. Genom att ta hänsyn till detta i klimatanpassningsstrategier kan beslutsfattare bidra till förbättrad motståndskraft både hållbart och socialt inkluderande.

3. Stärk kvinnors klimatanpassning genom åtgärder mot könsskillnader i markägande

Kvinnors markrättigheter är fortfarande svaga i Kenya och många andra länder. Det begränsar deras förmåga att anpassa sig till klimatförändringar och investera i långsiktiga strategier för resiliens. Det är viktigt att stärka kvinnors besittningsskydd, men våra resultat pekar också på bredare strukturella hinder – såsom ekonomisk exkludering och begränsad beslutsmakt – som begränsar kvinnors möjligheter att delta i klimatanpassning. Detta understryker vikten av ett intersektionellt förhållningssätt till marksäkerhet. Att ta itu med dessa utmaningar är inte bara nödvändigt för att förbättra klimatmotståndskraften utan också för att främja jämställdhet, vilket är en prioritering för såväl biståndsorganisationer som nationella regeringar.

4. Stärk markrättigheter för ökad klimatresiliens, men med hänsyn till politiska realiteter

Rapportens resultat ligger i linje med annan forskning som visar att säkra markrättigheter är avgörande för att stärka klimatanpassningen, särskilt för utsatta hushåll i marginaliserade regioner. Att formalisera markrättigheter är dock inte enbart en teknisk eller administrativ fråga, det är en djupt politisk process som kan rubba befintliga maktrelationer. Även om formalisering och privat äganderätt kan öka marksäkerheten för vissa, är det inte heller det enda sätten att förbättra markrättigheter och besittningsskydd. Beslutsfattare bör använda sig av en rad olika tillvägagångssätt, inklusive att stärka kollektiva markrättigheter, liksom att främja efterlevnaden av befintliga markrättigheter. Viktigast är att säkerställa att reformer av markförvaltningen inte förstärker befintliga ojämlikheter.

Summary

Across much of the world, the ability to access, use, and control land shapes economic well-being, identity, and power. The distribution and control of land, meanwhile, affects social and political order; including distributional or territorial conflicts, the settlement and movement of populations, and patterns of inequality and exclusion. Meanwhile, climate change is profoundly impacting the way that populations use and interact with the land. Farmers must make difficult decisions about whether to adopt new technologies or abandon farming altogether. Pastoralist communities must seek alternative grazing land – often leading to disputes with settled farmers or private estates.

In coastal cities, sea-level rise, flooding, and erosion are displacing populations, especially the poor, driving up land values, and exacerbating inequality. Taken together, the shrinking availability of land – whether for housing and urban development, agriculture, or livestock – is threatening livelihoods, intensifying competition, and fueling disputes between land users. Poorly defined, weakly enforced, or highly politicized land tenure rules can exacerbate these tensions and hinder effective climate change adaptation, especially for poor and marginalized communities.

This report narrows in on the question of land tenure – the norms and rules shaping a person's rights to land – asking how it affects the everyday strategies that people pursue to mitigate climate-related threats. Understanding how land tenure shapes everyday climate adaptation strategies is essential for policymakers and development practitioners working to design sustainable and effective locally grounded resilience policies.

We examine this question in the context of Kenya. While the Kenyan government positions itself as a leader in the transition to a green economy, particularly through investments in renewable energy (CSIS 2025), the country remains highly vulnerable to climate

change. This vulnerability stems not only from ecological fragility but also from widespread reliance on land – 71 percent of the rural population depends on agriculture, and over 9 million people rely on pastoralism – compounded by historical land policies that have concentrated arable land in the hands of an elite few, entrenching inequality in land access and tenure security (Kameri-Mbote, 2016; Government of Kenya, 2004).

To study if and how land tenure affects the climate resilience strategies that ordinary Kenyans pursue, we draw on an original face-to-face, household-level survey with 1000 respondents conducted across two counties of Kenya, one primarily rural and semi-arid (Laikipia), and one primarily urban and coastal (Mombasa). We supplement the survey findings with focus group discussions that we conducted in both counties. This report departs from existing studies focusing on land and climate adaptation in two important ways. First, rather than simply ask whether land tenure predicts whether a household adapts or not, we consider a range of possible responses. Specifically, we examine how land tenure affects the likelihood that people will:

- engage in climate adaptation at the household or community-level,
- organize collectively to demand political change, or
- support violent or coercive strategies to reclaim or defend land from others.

Second, while several studies focus on land tenure in dichotomous terms (e.g. strong vs. weak or formal vs. informal), we introduce a measurement strategy comprising three dimensions: the system of tenure, the extent of formal rights, and individuals' perceived tenure security. By considering these three dimensions, policymakers can gain additional insights into how land tenure shapes, incentivizes or discourages pro-active strategies in the face of climate change.

Main findings

Broadly, the report finds that different dimensions of land tenure are important in helping to explain the climate adaptation and resilience strategies that people support or pursue. The report's key findings are as follows:

1. Kenyans widely recognize climate change as a threat, with differences across region and livelihood

Across urban and rural areas, Kenyans recognize the effects of climate change in their daily lives, though the nature of these threats varies by region and livelihood. In the coastal and urban county of Mombasa, flooding is the primary concern, especially as rapid urbanization, congestion, and inadequate drainage infrastructure exacerbate climate vulnerability. In the more arid and inland county of Laikipia, where residents rely on agriculture and pastoralism, 60 percent of respondents reported being seriously affected by drought within the past 2–3 years. Livelihood type helps explain the types of resilience strategies that people pursue. For instance, we find that pastoralist households are especially likely to engage in both household and community-level adaptation efforts, such as shifting to more drought-resilient cattle, conserving water and pasture, investing in infrastructure, and planting trees. Yet while the everyday challenges posed by extreme weather vary across livelihoods and urban/rural spaces, variation in land tenure is a significant and sometimes more important factor in explaining responses to climate change, which we explain in the subsequent findings.

2. Different land tenure systems encourage collective or individual adaptation

The tenure system – whether land is communal, private, or public – affects whether people pursue individual or collective climate

adaptation strategies. People living on communal and public land are more likely to engage in collective resilience efforts, such as pasture management and water conservation. In pastoralist areas of Laikipia, communal land governance structures help coordinate grazing management and drought mitigation efforts. In contrast, private land tenure is more often associated with individual adaptation strategies, such as home modifications or shifting to drought-resistant livestock.

3. Strong land rights encourage investment in climate resilience efforts and political advocacy

People with strong land rights – measured by title deed ownership and a Land Rights Index (LRI) – are more likely than those with weak or insecure land tenure to invest in climate adaptation and engage in political advocacy. Notably, people with strong rights are more likely than those with weak rights to invest in resilience-enhancing upgrades to their home and community. In addition, people with strong land rights are also more likely to participate in protests and other advocacy efforts aimed at improving environmental protections. Focus group participants in Laikipia and Mombasa, for example, described landowners – rather than renters – as having greater confidence in engaging with authorities to demand climate-related interventions.

4. Tenure insecurity can bolster support for violence and discourage adaptation, while motivating political action

People who lack tenure security – those who fear eviction or losing their land – are less likely to invest in adaptive strategies and more likely to support violence. In particular, individuals who fear eviction are more likely to endorse taking land by force as a way to protect their livelihoods. People with a title deed, meanwhile, are more likely

to reject such violence. In Laikipia, pastoralists describe how drought leads some people to graze their livestock on large-scale ranches or private farms. These movements can result in clashes between pastoralists and private landowners or state security forces. Some participants also stressed the need to take up arms for self-defense in a context where banditry, cattle raiding, and grazing conflicts are common. Focus groups in Mombasa, meanwhile, highlighted how contested land claims, forced evictions, and historical dispossession drive political protest and, in some cases, conflict. Yet while tenure insecurity can increase support for violence and dampen incentives to invest in climate resilience efforts, people without tenure security are more likely than the tenure secure to mobilize politically to voice climate-related concerns.

5. Trust in institutions shapes perceived tenure security and climate resilience

While there are many factors that influence tenure security, trust in institutions – whether formal or informal – plays an important role. Hence, while formal land documentation may go far in improving perceived security, formalization only improves security where people trust that their rights will be recognized and enforced both by other societal actors and the state. In Laikipia, focus group participants expressed confidence in local authorities and communal land governance structures, which bolstered their tenure security. In contrast, respondents in Mombasa described widespread distrust in land authorities, citing corruption, unclear regulations, and legal uncertainty. Survey results confirm this gap: while 70 percent of Laikipia residents believe local authorities will protect their land rights, only 44 percent in Mombasa share the same confidence. These findings highlight the importance of transparent and accountable land governance systems in strengthening tenure security, and by extension, climate resilience.6. Gender disparities in land tenure limit women's climate resilience strategies

Women in Kenya continue to face structural barriers to land ownership and tenure security, which limit their ability to engage in climate adaptation. Women in the study were less likely to hold title deeds, more likely to fear eviction, and less engaged in both household- and community-level adaptation efforts. Even among those with formal land rights, women participated less in resilience-building measures, such as adopting climate-smart agricultural practices or joining community conservation efforts. These patterns suggest that beyond tenure insecurity, broader economic and social barriers – such as limited access to credit, lower decision-making power, and exclusion from land governance structures – constrain women's ability to take proactive resilience measures.

Key takeaways for policymakers

Taken together, our study highlights the different ways through which land tenure can shape the way that people respond to climate-related threats. We point to three key mechanisms that may help explain our findings. In particular, we suggest that variation in the rules and norms shaping how people access and secure rights to land have implications for climate resilience in so far as they: (a) shape perceptions of power and agency, (b) affect collective action capacity, and (c) activate grievances.

a) **Agency and power:** First, when people have secure and enforceable land rights, they tend to feel a greater sense of control over their future. This confidence reduces uncertainty and encourages long-term investments in climate adaptation. In contrast, people with weak or insecure land tenure often hesitate to make such investments, fearing displacement or the loss of their land. Moreover, people who lack tenure security may also lack the social or economic power to make such investments, even when they have an interest in doing so.

b) **Collective action capacity:** The way land is owned and governed shapes how people organize to improve their climate resilience. In

the Kenyan context, we found that shared governance structures reinforce cooperative adaptation efforts in both communal and public land settings, while private land tenure is more often associated with individual decision-making. These different governance norms influence whether climate resilience strategies are pursued collectively or individually.

c) **Grievance activation:** Perceived tenure insecurity can fuel resentment, particularly when people feel excluded from land access or at risk of losing their property. In some cases, these grievances drive political mobilization or resource-based disputes, particularly in contexts where land is already contested.

Each of these mechanisms has powerful implications for understanding how different groups navigate climate risks, access resources, and engage with both state and non-state actors in their adaptation efforts. These mechanisms not only influence individual and community-level responses to climate threats but also shape broader socio-political dynamics, including conflict, cooperation, and institutional trust. Based on our findings, we identify a set of key considerations for policymakers as they consider how to support local communities in their efforts to become more climate resilient.

1. Consider both formal and perceived land tenure security in climate adaptation policies

Policymakers should consider both formal and perceived aspects of land tenure when designing interventions. As this report shows, formal tenure security does not always translate into perceived security. Policies that focus only on formal land titles risk overlooking key social and political dynamics that may undermine tenure security. Recognizing that the source of land rights may be either formal or informal institutions, our findings stress that households and communities are in the best position to engage in cooperative and long-term adaptive strategies when they benefit from both strong tenure rights (e.g. title deed or written document from the government in

the case of Kenya) and trust that their rights will be recognized and protected into the future (perceived tenure security).

2. Integrate land tenure dynamics into climate resilience strategies

Policymakers should recognize that land tenure affects climate resilience not only through access to resources but also by shaping perceptions of agency, collective action capacity, and grievance. Understanding these mechanisms is critical to designing effective climate adaptation policies that align with local governance structures, address social tensions, and strengthen institutional trust. For example, policies that strengthen land security can increase confidence in long-term investments in adaptation, and strategies that focus on reinforcing cooperative land management structures may encourage collective resilience efforts. Likewise, recognizing land-related grievances and addressing tenure insecurity in adaptation planning can help prevent disputes that may escalate into conflict. By incorporating these dynamics into climate adaptation strategies, policymakers can enhance resilience in ways that are both sustainable and socially inclusive.

3. Address gender disparities in land tenure to strengthen women's climate adaptation

Women's land rights remain weak in Kenya and many other countries, limiting their ability to adapt to climate change and invest in long-term resilience strategies. While strengthening women's tenure security is critical, our findings also point to broader structural barriers – such as financial exclusion and limited decision-making power – that constrain women's agency in climate adaptation. This underlines the importance of an intersectional approach to land security. Addressing these challenges is not only necessary for enhancing

climate resilience but also for advancing gender equality, a priority for aid agencies and national governments.

4. Strengthen land rights to enhance climate resilience, while recognizing political realities

The report's findings align with research showing that secure land rights are critical for strengthening climate adaptation, particularly for vulnerable households in marginalized regions. However, land formalization is not merely a technical or administrative endeavor; it is a deeply political process that can disrupt existing power relations. While formalization and private titling can increase land security for some, they are not the only ways to enhance land rights and tenure security. Policymakers should recognize a range of approaches, including strengthening communal tenure and improving enforcement of existing land rights, to ensure that land governance reforms do not reinforce existing inequalities.

1 Introduction

Climate change is increasingly affecting livelihoods and security around the world (IPCC 2023). Effects are often dramatic. Devastating wildfires across the U.S, Canada, Brazil, and mainland Europe have displaced hundreds of thousands of people. In South America, millions of acres of Amazon forest have burned, many of which belonged to indigenous communities (Ramírez 2024). In late 2024, meanwhile, a typhoon trigged devastating floods and landslides across southeast Asia, displacing millions of people across the region. Unpreceded heavy rainfall in Kenya led to flash flooding that killed around 300 people and displaced 55,000 people (KRC 2024). Beyond these dramatic headlines, unprecedented global temperatures are prolonging droughts, raising sea levels, and making weather patterns more unpredictable – factors that threaten food and housing security while placing poor and marginalized populations, espe-cially dryland populations, in increasingly precarious situations (EUJRC 2024).

The impact of climate change on livelihoods – especially among already marginalized and vulnerable communities – is well studied in academic and policy research circles (Connolly-Boutin & Smit 2016; Dube et al. 2016; FAO 2015a; IPCC 2020, 2023; von Uexkull & Buhaug 2021). Yet while international organizations, national governments, cities, and private sector actors debate whether and how to mitigate climate change, these debates are often contentious (Dimitrov 2016; Effiong et al. 2024; Huber & Murray 2024) and meaningful changes at national and global levels are often deferred or avoided altogether (IPCC 2023).

This means that local populations, especially in countries whose governments lack the capacity or political will to respond proactively, are largely on their own in terms of how they adapt and mitigate climate threats. This is especially so as financing for locally-led adaptation efforts is notably lacking (Tye and Suarez 2021). This report seeks to contribute to the broader research on conditions for

climate adaptation by examining the role of land tenure in shaping such strategies at the micro level. We argue that understanding how individual households respond and adapt to climate-related threats hinges on the rules, relationships, and norms shaping how people access and secure land – including land for residential, business, agricultural or livestock rearing purposes. We focus on land because it serves as critical lens for understanding individual and collective behavior. More than the soil beneath the feet, land confers belonging and social status, denotes territorial boundaries, establishes relationships of power and control, and serves as a critical livelihood resource and productive asset (Albertus and Klaus 2025; Lawry et al. 2017; Young and Sing'Oei 2011).

The question of land – of who should have it, the rights to which they should be entitled, and how it is used, transacted, and distributed – is contentious and political. Indeed, competition and control over land has often been the basis of war-making and violent conflict – from wars of colonial conquest, to civil wars, to small-scale violence between communal groups. Moreover, the rules governing land holding and land access (i.e., land tenure arrangements) are more than economic institutions, but political and social institutions as well (Boone 2014). They establish and create relationships of political dependency and authority, for example, between landlords and tenants, states and citizens, 'natives' and newcomers, or between male landowners and female land users. In this regard, the way land is ordered and controlled – the "regimes of possession" (Lund 2024) – shapes the patterns and dynamic of social, economic, and political inequality (Albertus 2025). In addition, owning land is about having power. Across urban and rural spaces, to lack land (or housing) is to be a squatter, tenant, or renter – a status that connotes insecurity, dependence, and vulnerability (Elfversson and Höglund 2018; Weinstein 2021).

Taken together, we expect the terms through which people access or own land, and the rights that they have to such land, to play a powerful role in shaping the strategies of climate adaptation and

resilience that ordinary people pursue. In this regard, while adaptation and climate resilience measures take place at multiple scales (e.g. international, regional, and national), this report focuses on the local-level responses, with the individual household member as the main unit of analysis.

This report is not the first to acknowledge the relationship between land and climate adaptation. Among the reports and academic studies that raise the issue of land, the IPCC Special Report on Climate Change and Land (SRCCL) is the most extensive. The key premise of the SRCCL and related reports is that land use – and changing land use – is a central driver of climate change. Mitigating climate change – and its downstream effects – thus relies on land users adopting more sustainable land use practices. The solution, as the SRCCL outlines, relies on strengthening tenure rights – through formalization and state recognition – to promote climate adaptation. We build on this insight, but move beyond binary conceptualizations of tenure (as secure or insecure).

Drawing on household-level evidence from Kenya, we instead examine how varied land tenure systems, land rights, and perceived security independently and jointly shape the way that people respond to climate threats. In this regard, we also expand the notion of adaptation and resilience to encompass a wide range of responses that people might pursue, ranging from cooperative to contentious, and from the household-level to the more collective. Importantly, we do not assume that stronger or more formal tenure rights necessarily lead to more effective adaptive responses, but instead allow our results to inform our interpretation of these linkages.

1.1 Aims and scope

There are many ways to study how access, rights, and control over land might affect, not only climate resilience, but development and political order more broadly. We focus our analysis on three dimensions of land tenure: (1) the *land tenure system*, which refers to the rules

and norms that govern how people access and use land (FAO 2002) and includes state, communal, and private land; (2) *land rights*, which denote the authority that a person has – whether recognized by the state or other formal/informal institutions – to manage, control, and transfer land, and (3) *perceived tenure security*, which refers to an individual's evaluation of their tenure rights, regardless of tenure rules. We expand on this conceptualization in Section 2.2.

Our central research question asks: How does land tenure shape individual and household-level resilience strategies? We expect that land tenure should, through different pathways, influence how people respond, adapt, or organize to strengthen their resilience and preserve their livelihood in the face of climate-related threats. Specifically, we examine if and how land tenure affects the propensity for people to:

- Prefer more household-level or collectivist strategies when confronting climate threats (*adaptive strategies*)
- Mobilize to demand political change (*political strategies*)
- Support violent or coercive strategies to reclaim or defend land (*coercive strategies*)

By investigating the varied strategies that people use to insulate and protect themselves from climate-related disaster, we hope to highlight the often-overlooked agency of people and communities to respond to a changing environment. Importantly, these strategies need not be "pro-social", but can vary in their degree of cooperation, contention, and violent coercion. Resilience strategies can include intra- and inter-group cooperation around resource governance, political mobilization (e.g., protests) to demand infrastructure improvements, looting and theft (e.g., of land or cattle), and decisions to migrate or relocate (cf. Petrova 2021). We analyze these strategies as political responses as much as they are social or technical. They are tactics of survival played out across varying contexts of insecurity, resource-scarcity, and a limited or unresponsive state. Our primary interest, then, is not to establish which strategies succeed in bolstering

resilience, but to identify how different institutional settings, especially around land tenure, shape the perceived set of available strategies for building resilience in the context of climate change. Doing so can help policymakers and practitioners gain a clearer picture of how land-related factors work to encourage or limit the ability of ordinary people to make their household and communities more climate resilient.

1.2 Empirical context: Land and climate change in Kenya

We study the questions posed above in the context of Kenya. We do so by relying on a household-level survey with 1,000 respondents, supplemented with focus group interviews, across two counties of Kenya – Mombasa and Laikipia. Our main focus is on the individual and household level, but our research design also means that we can aggregate individual-level responses to higher-level units (e.g. ward, sub-county, or county) in order to analyze broader spatial patterns. We selected Mombasa and Laikipia as both counties enable us to capture variation across each of the main sub-dimensions of land tenure, while also accounting for different settlement patterns (i.e. across urban, rural, and peri-urban areas), different livelihood strategies (e.g., pastoralism, agriculture, or commerce), and varying geographies and climatic zones (i.e., from drought-prone arid zones to coastal flood zones).

Kenya is an important country in which to study the link between land and climate resilience for several reasons. First, Kenya is extremely vulnerable to the effects of climate change, due both to it ecological precarity – especially it's semi-arid and arid regions – as well as the population's reliance on land as source of income and livelihood. Notably, agriculture employs 71 percent of the country's rural population and accounts for a third of the country's GDP (IFAD 2025). Yet according to a recent report, only 20 percent of Kenya's land is suitable for agriculture – reflecting significant soil

degradation in recent years (Heinrich Boell Foundation, 2025). In Kenya's Arid and Semi-Arid Lands (ASALs) meanwhile, livestock production accounts for approximately 95 percent of family income (Bahta et al., 2023). Yet in 2023 alone, herding communities lost more than 2.6 million cattle due to drought.[1]

The country's vulnerability to climate change has likely played a role in the government's efforts to position itself as a regional leader in the transition to a green economy, particularly through investments in renewable energy (CSIS 2025). Abundant data show that climate change has negatively impacted Kenya's agricultural and livestock sectors, bringing greater risks of hunger and food insecurity, underlining the need for adaptation (Kabubo-Mariara & Mulwa 2019; Kogo, Kumar & Koech 2021). In addition to livestock wealth and food production, soil erosion and flooding threatens homesteads, urban settlements, and key infrastructure, as vividly demonstrated during the 2024 floods in Kenya, when extreme rainfall caused landslides and flooding that resulted in the deaths of over 300 people (OCHA 2024). Episodes like this highlight both Kenya's vulnerability to climate change impacts, and the importance of exploring the prospects and limitations for adaptation and resilience-building at different levels of society.

Second, and crucially, land is among the most important issues shaping Kenyan political and social life. The centrality of land dates back to British colonial rule, when the colonial government seized the country's most arable land from indigenous Kenyans, transferring ownership to white settlers. In this process, the government placed large segments of the population into native reserves, while rendering many Kenyans landless or without rights to land. Grievances over land served as the primary motive for the formation of the Land and Freedom Army, which fought for independence from Britain as a way to re-claim land rights. The civil war, known as Mau Mau, resulted in the deaths of tens of thousands of people – mostly

[1] Humanitarian Action, Kenya Drought Response Plan (2023).

indigenous Kenyans – and paved the way for Kenya's independence (Branch 2011). Yet while the war brought independence, distributional struggles over land persist to this day. A central theme of these distributional struggles is the perception that each Kenyan president since independence has used land as a way to consolidate the land rights of his political supporters and co-ethnics – by allocating parcel or title deeds – while ignoring the land demands or land claims of ethnic communities associated with the political opposition.[2] Articled as narratives of victimhood and threat, this central grievance can provide a potent source of ethnic and political mobilization, especially during elections (Klaus 2020, Boone 2014).

Third, and related to this history, there is notable variation in the land tenure systems across the country, with most counties having land governed by all three tenure systems– public (i.e. government), private, and communal (i.e. customary). This institutional hybridity – common across many former colonial regimes – enables us to examine how differences in local land tenure might affect climate adaptation and resilience. There is also notable variation in the degree of land rights formalization and documentation, which provides one way of observing land rights. For instance, in many northern counties, fewer than 10 percent of residents hold private titles, while in some other counties, more than 80 percent of the population reports to hold private title to their land (KNBS 2016).[3] In general, rates of land titling are highest is the dense and highly arable zones of the Central Rift Valley, and lowest in the more arid and primarily pastoralist zones of the north and northeast, where most land is held communally.

[2] The lines of political supporters and non-supporters have typically followed ethnic lines, with politician's rewarding members of their own ethnic community and other ethnic groups within a political alliance, while punishing ethnic communities who are presumed to support a rival political movement or party. For example, the first president, Jomo Kenyatta, is widely criticized for prioritizing the land rights of his co-ethnic community – the Kikuyu – at the expense of other, smaller ethnic groups.

[3] Rates of private title are under 10 percent in Wajir, Turkana, Tana River, Marasbit, Samburu, Isiolo, and Mandera. Rates of private title are over 80 percent in Nyandarua, Murang'a, Kajiado, and Nandi counties (KNBS 2016).

On average, 55 percent of the population lacks individual titles to land. This sub-national variation enables us to draw insights from a range of tenure regimes and varying contexts of tenure security. In addition, the geographic and urban/rural variation in land tenure within Kenya enables us to draw conclusions of relevance to other rural and urban settings, as well as to countries with fertile, coastal, and arid zones. Hence, while our evidence draws only from Kenya, we expect our findings from this context to hold relevance for other climate vulnerable countries, especially those in sub-Saharan Africa where land is central to livelihood, and where there are several – and sometimes overlapping – land tenure systems.

While we seek to provide a nuanced assessment of the question in focus, our approach is limited in a number of important ways. First, there are many important dimensions of the land tenure system, land rights, and tenure security that our study does not capture, or which we do not measure effectively. For instance, while our survey captures the extent of owner rights an individual has to the land they live on (e.g. ability to sell or decide who inherits), we do not measure the full extent of user rights an individual may have, even in the absence of owner rights. Second, in focusing on the household, our survey does not capture the larger structural and political forces that shape different dimensions of land tenure. For example, we do not account for the processes of land acquisition and dispossession – by state or private actors – that might be shaping a person's perceived or actual land rights, although our focus group discussions provide some insights into these broader dynamics. Third, because this report relies on observational data, we cannot make conclusive claims about causality. That is, while we strive to account (control) for potential confounders, we can at best make claims about associational relationships; claims that we bolster by drawing on our own prior research experience to help interpret statistical findings, alongside qualitative interviews that shed light on possible mechanisms. Fourth, our study focuses on strategies people may take while remaining on the land, but we exclude an additional and important response to climate change, which is migration and re-location. Our

lack of attention to this critical component of climate resilience does not imply that this is not an equally important strategy, but merely that the design of our study could not capture this particular dynamic.

1.3 Report outline

The report proceeds as follows. In the next chapter, we review the existing literature relevant to our study, with a focus on three key mechanisms identified in prior research that link land tenure to climate adaptation and vulnerability. We then specify remaining gaps, and how we see this report helping to fill those gaps. Next, we explain the key concepts in our study – land tenure and climate resilience – and theorize the relationship between both concepts. In Chapter 3, we outline our research design, discussing our case selection and empirical strategy, including the design of our survey and focus group discussions. Chapter 4 describes and highlights lived experiences of climate exposure in Laikipia and Mombasa, the two counties in focus in our study, drawing both on our survey and focus group data. Chapter 5 and 6 present our main results. In Chapter 5, we conduct a thorough quantitative analysis of the association between land tenure and climate resilience strategies, organized based on the three forms of strategies that we theorize – individual and collective adaptation, political engagement, and coercion. Chapter 6 draws on our qualitative data to help interpret and contextualize our quantitative findings. Finally, Chapter 7 concludes the report by summarizes our key insights, and highlighting key takeaways for policymakers, practitioners, and for future research.

2 Land tenure and climate resilience

2.1 Review of the field

Climate resilience refers to the ability of a given society or community to withstand and cope with the pressure of climate change and climate-related shocks. The Intergovernmental Panel on Climate Change (IPCC), for example, defines resilience as "the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity of self-organization, and the capacity to adapt to stress and change" (IPCC 2007: 86). Resilience is generally understood to encompass three key dimensions: absorptive capacity (the ability of societies to "bounce back" from shocks to the system), adaptive capacity (the ability of individuals and communities to adapt to changing circumstances), and transformative capacity – the ability of society to fundamentally alter the social system so that root causes of risk are addressed (McCandless and Simpson 2015).

A number of recent studies have emphasized the importance of land tenure in mitigating vulnerability to climate-induced disaster (ILC 2024; McEvoy and Mitchell 2019; Reale and Handmer 2011; Tseng et al. 2021). These studies are part of a broader literature demonstrating the importance of land tenure security for agricultural productivity and development (e.g., Besley 1995; FAO 2015b; Goldstein and Udry 2008), economic growth (de Soto 2000), women's rights (Meinzen-Dick et al. 2019), and political stability (Kapstein 2017; Klaus 2020). Studies specifically focusing on the links between land tenure and climate resilience point to three key mechanisms linking land tenure – in particular, land tenure security – with climate adaptation and vulnerability.

The first mechanism focuses on how land security shapes the *decisions and capacity of users to adapt* to climate change. The central claim is that where farmers are tenure secure, they are more likely to invest in longer-term adaptive strategies, like agroforestry, climate-smart water management systems, and soil conservation (Chakrabarti 2020; Teklewold et al., 2019). By contrast, where farmers lack tenure security, research indicates they are more risk-averse (Murken & Gornott 2022), cannot use their land as collateral (McEvoy and Mitchell 2019), and have fewer means or incentives to invest in their land (Besley 1995). However, recent research also complicates this picture. Mukherjee and Fransen (2024), for instance, study the choice between staying and investing in adaptation vs. migration as a resilience strategy, and emphasize the non-linear nature of this relationship. They show that large-scale, tenure secure landowners may opt to invest in adaptation whereas smaller-scale farmers may prefer risk diversification through part of the household migrating to urban centers; however, those with least resources may afford neither strategy. Meanwhile, Toulmin provides additional nuance by studying processes of adaptation over a long time in Mali. Her research illustrates the range of adaptive measures taken by households in the face of climate change and land scarcity in a context where all land is vested in the government, underlining that the resilience strategies of households cannot be understood merely as a function of formalized, private tenure security (Toulmin 2020).

Second, studies indicate that land tenure systems can affect resilience strategies by shaping the *incentives of governments to invest* (or not invest) in resilience-enhancing infrastructure. Both state and private actors are more likely to invest in infrastructure projects where property rights are well defined. Informal spaces, by contrast, are likely to deter the types of investment that are essential for making communities – especially urban informal settlements – more resilient to climate change (Cities Alliance 2021). This is partly due to factors that are endogenous to tenure insecure environments: more precarious geography, weak political power of residents, low land

values, weak tax bases, and the inability of poor households to invest in their properties (Field 2005).

Third, and by definition, *land insecure residents and communities are more vulnerable* to displacement and eviction. Without evidence of tenure rights, people have weak legal claims to their land should they encounter another claimant. When eviction or displacement does occur – either because of climate-induced natural disaster or intentional eviction – residents have few alternative livelihood strategies, and those who lack formal tenure rights are often excluded from compensation and resettlement programs (Doshi 2013; Mitchell, 2014; Shannon et al. 2018). These populations are thus at higher risk of being forced to leave their communities, losing critical social bonds, security, and sources of income; in turn, their displacement often ends up exacerbating population pressure in the spaces to which they re-locate (Obeng-Odoom 2011; Omoegun, MacKie, and Brown 2019; Reale and Handmer 2011).

The studies outlined above are important, but limited in a few ways. First, land security tends to be treated in binary terms without accounting for variation in the form of tenure and degree of security. Second, most studies focus on a particular type of community, such as farmers (Murken and Gornott 2022) or the urban poor (Paller 2019), without placing different types of communities in a comparative perspective. Third, these studies focus primarily on vulnerability, with little attention to the everyday strategies that people use – in spite or because of tenure insecurity – to bolster resilience. Fourth, and relatedly, most of these studies overlook the socio-political dimension of resilience and adaptation – including responses that may be disruptive, contentious, and even violent. Finally, many of these studies assume that land rights that are private, formalized, or titled are essential for incentivizing or enabling practices that enhance climate adaptation and resilience. This starting point is overly simplistic, and overlooks the deeply political nature of land formalization, the ways that it creates new winners and losers, and the ways that privatization or formalization may also shape

behaviours that work against collective efforts to improve climate resilience.

A key aim of this study is to expand what practitioners and academic alike know and understand about how land tenure shapes household and individual responses to the threat that climate change poses in their everyday lives. We seek to contribute new knowledge through considering the broader repertoire of strategies that individuals and communities may adopt to increase their climate resilience, as well as to unpack and nuance the way that tenure security is defined and measured. Below, we lay the conceptual foundations for this, discussing these two key concepts – land tenure and resilience strategies – in turn.

2.2 Conceptualizing land tenure

As mentioned above, we focus on three dimensions of land tenure: (1) *land tenure system,* (2) *land rights*, and (3) *perceived tenure security*. The land tenure system crucially shapes the rights that individual households or groups have in relation to land, and the norms and institutions that govern these rights. A key distinction in postcolonial contexts is between statist and neo-customary land regimes (Boone 2014). In the former, the state directly governs land access and property rights, whereas in the latter, these powers are vested in custom-ary or neo-customary authorities. In most cases, land under neocustomary regimes is held communally (e.g., by a community defined based on identity or kinship), rather than by private individuals or households, although some rights may be allocated to households within the communal regime (Chimhowu and Woodhouse 2006). In turn, the form and extent of recognition offered individual or collec-tive land holders varies within and across different tenure regimes. Such recognition relates both to ownership (which includes the power to sell the land and make other types of transactions based on it), and to other rights to use the land in different ways without formally owning it (Lund 2022). In recent decades,

many African countries – including Kenya – have introduced reforms to strengthen the formal protection of communal tenure rights (Wily 2017; Rights and Resources Initiative 2021).

Land tenure consists of legal, social, and political dimensions and entails observable institutional or formal dimensions, as well as individual perceptions that are often black-boxed in empirical research (Dachaga and de Vries 2021). These dimensions of land tenure – the objective and subjective – are often correlated, but need not be. Indeed, many studies demonstrate or argue that a land user's perceptions of tenure security improve when they hold formal titles to their land (Alhola and Gwaindepi 2024). Yet even when holding a title deed, an individual may question their tenure security. For example, the user may belong to a marginalized minority group and worry about a state or private actor expropriating her land (Kenney-Lazar 2018; Lund 2024). Conversely, while residents of informal settlements usually have no legal right to the state or private land on which they reside, they may feel relatively land secure – often because local political elites offer *de facto* protection or because the surrounding community recognizes their claims (Elfversson and Höglund 2018; Holland 2016).

Importantly, while development economists and practitioners tend to treat the distribution and recognition of land rights as a feature weak state capacity, we see variation in land tenure rights as a function of politics; of state actors and politicians choosing whose rights to secure and whose to neglect or undermine (Albertus 2021; Boone 2014; Dyzenhaus 2021; Hassan and Klaus 2023; Lund and Boone 2013; Onoma 2009). Land tenure regimes are the product of political struggles and are often subject to continual contestation and revision – between different political interest groups, between 'customary' and 'modern' institutions, as well as between different layers of government institutions (Lund 2022; 2024). This also means that land tenure is both contextual and dynamic. Within the same country, individuals and communities living in different locations may have very different forms or degrees of tenure security despite

having similar formal rights (e.g., holding a title deed). Tenure rights are temporally dynamic as well: an individual may feel land tenure secure in one political moment and less so in another. For example, in Kenya's Tana River County, local communities' perceptions that their land or grazing rights are secure have been strongly dependent on the outcome of local elections (Elfversson 2019). Hence, while our empirical analysis does not explicitly examine the politics surrounding and shape land rights and tenure security, it is a crucial part of understanding the land tenure-climate resilience nexus.

2.3 Conceptualizing climate resilience strategies

In this study, we use the concept of "resilience strategies" to refer to the actions individuals and communities take *intentionally* in order to mitigate current and future climate risks. Intentionality is a key criterion for identifying a particular action or set of actions as a strategic response to climate change. That is, individuals or communities must perceive a certain level of risk (created or heightened by the changing environment) and actively take action in order to mitigate such risk.

We expect strategies of resilience to take at least one of three broad forms. The first – individual and community-level adaptation – involves strategies aimed at improving well-being and survival without challenging broader status quo arrangements. The other two broad strategies – political engagement and violent re-distribution – tend to involve more contentious collective action to alter the status quo (Tarrow 1996). We briefly describe each of these strategies below. We focus on the strategies people may use while remaining on their land. A growing literature has focused on understanding the conditions that lead people to migrate, an exit strategy that may be chosen when challenging or working within the status quo seems implausible (Aksakal and Schmidt 2015; Obeng-Odoom 2022). However, we see this as a qualitatively different form of response

than strategies that are taken in order to defend and maintain a current livelihood, which is the focus of our study.

- *Individual- and community-level adaptation efforts*: In many contexts, households may find it most feasible or beneficial to focus on their own household's ability to survive and thrive amidst climate-change, and to make household-level adjustments to this end. These efforts can include switching to more a drought-tolerant or early-maturing seed variety, installing solar panels on one's home, or investing in on-farm tree-planting (Belay et al. 2017). Community members can also organize collectively to protect against climate-related risks. These grassroots efforts may rely on assistance from an NGO, donor, or politician, but are primarily community-driven efforts to organize and resolve a particular issue. Such efforts might include repairing drainage ditches to prevent flooding, reforesting public space to mitigate mudslides, investing in urban farms to insulate against food price hikes, or establishing village-level savings and loan groups to help members manage income shocks.
- *Political engagement and mobilization:* This encompasses forms of collective action aimed at improving the responsiveness of the state or political leaders. Mobilization can take the form of protests or lobbying efforts to demand investment in climate-resilient infrastructure (e.g., drainage or housing upgrades in urban neighborhoods, investment in early warning systems), or recognition of land or housing rights. Political mobilization can also include electoral mobilization to elect a certain party or politician perceived to be more responsive to climate-related challenges. Political strategies are distinct from other collective behaviors in that actions are aimed at disrupting the status quo by engaging politicians and changing the behavior of political leaders or policy.
- *Violent redistribution*: Individuals or community members may also decide to pursue violent forms of contentious collective action. A well-established literature linking climate change and conflict

> points to the many pathways through which increasingly harsh climate condition push or compel people or communities to use violence – either as a way of defending increasingly scarce resources or precarious resource access, or as a way of expanding control over land and territory (Homer-Dixon 1999; Theisen 2012; Sharifi et al. 2021; Buhaug 2015, Linke et al. 2015; Fjelde & von Uexkull 2012). Violent re-distribution to alter resource distribution in favor of one's family or community could take the form of cattle-raiding to restore depleted livestock reserves, violently displacing a neighboring community to take control of their farms, business, or other property, or using violence to assert territorial control in order to control resource access such as grazing land, water, or aid (Fjelde & von Uexkull 2012).

Existing research anticipates a few of the potential mechanisms through which land tenure may shape climate resilience. Building on these insights, as well as broader theories of contentious politics and collective action, we expect that adaptive resilience mechanisms – those in which individual or communities make investments in their households or broader community – are more likely where people feel relatively tenure secure. By contrast, where people lack tenure security, they may be more likely to pursue resilience strategies that require fewer investments in time and capital, or not take any such measures at all. Grievances around tenure insecurity can also form the basis for violent mobilization. In the next section, we explain our approach to study empirically if and how the different dimensions of land tenure affect the forms of climate resilience strategies we have conceptualized in this section.

3 Research design

To examine how land tenure affects climate resilience strategies, we rely on two main sources of data. Our primary data source is a household-level survey that we implemented across randomly selected sites of Mombasa and Laikipia counties. The survey data enable us to observe broad descriptive patterns across key variables of interest. They also allow us to statistically analyze the effects of key explanatory variables (i.e. land tenure system, land rights, and perceived security) on key outcomes of interest (i.e., different strategies of climate adaptation and resilience). This method also enables us to account for a number of alternative explanations, while controlling for relevant factors, including socio-economic factors and other potential confounders. As a way to further probe the mechanisms linking land rights and climate response strategies, we conducted focus group discussions in selected sites within Mombasa and Laikipia counties. This nested approach enables us to probe the patterns emerging in the quantitative analysis in more depth, and unpack key dimensions of land tenure and adaptation strategies not captured in the quantitative data.

3.1 Case Selection

Kenya is divided into 47 counties, which serve as the largest administrative and electoral unit. We focused our data collection on two of these counties, both of which are highly vulnerable to climate change effects. The first, Laikipia, is an inland county located in the former Rift Valley region in north central Kenya. While geographically diverse, its climate is primarily semi-arid, with only about 20 percent of the land being arable, and 50 percent of the remaining land under livestock production (MoALF 2017). The county's population is primarily rural, but urban areas are growing – including informal settlements – as people migrate to urban centres from more marginalized and climate vulnerable regions of the county to seek

alternative sources of income. Mombasa County, by contrast, is a low-lying coastal region and Kenya's second-largest city, with a population of 1.2 million. Its rapid urban expansion has strained land resources and infrastructure, exacerbating climate-related risks such as flooding, coastal erosion, and pollution of marine ecosystems.

Taken together, our data from Laikipia and Mombasa enable us to observe variation in our key variables of interest both within and between the two counties. We are thus able to draw on empirical insights from a primarily dense urban county (Mombasa) and one that is primarily rural (Laikipia) and compare between a coastal environment (Mombasa) and semi-arid rangeland (Laikipia).

However, despite these differences, the case selection enables us to assume a relatively similar *level* exposure to climate-related weather events, even while the form of such exposure tends to vary between the two counties (i.e. drought in Laikipia and increased rains and flooding in Mombasa). Both counties, moreover, contain spaces where rights to land are intensely contested and where property rights are weak or unevenly enforced. In Laikipia, small-scale farmers, pastoralists communities, and large-scale ranchers and conservancies – many of which are foreign-owned – make competing claims on how the land is owned and used.[4] Like Laikipia, issues of land rights and access in Mombasa are deeply intertwined with highly contested land politics and grievances over land dispossession, partly pre-dating British colonial rule (Brennan 2008).[5] Land grievances in Mombasa and the greater coast region are often rooted in struggles between absentee or "upcountry" landlords, and local or indigenous communities who have been rendered squatters (Manji 2020).

[4] According to the Kenya Land Alliance, 40.3 percent of land in Laikipia County is owned by 48 large-scale ranches (KLA 2024). Many of these owners gained access to this land during British colonial rule, and have maintained ownership through colonial-era land laws that granted 999-year leases to British settlers.

[5] We can trace this tenure insecurity and demand for land to the Arab- Swahili slave trade and the British colonial rule. The slave trade led to the first wave of land dispossessions, while colonial rule institutionalized land rights along racial lines, excluding most coastal residents from the right to own land.

Importantly, there is also variation both within and between each county in terms of the type of land tenure and the rights of land users, which we aim to capture in our survey. Land tenure in Laikipia takes many forms, including (1) government land (i.e. public land), which includes settlement schemes set aside for small-scale agriculture and forest reserve land, (2) private land, which includes large-scale farms, ranches and wildlife conservancies,[6] as well as smallholder farms, and (3) community lands (i.e. group ranches) set aside for pastoralist communities. In Mombasa, land tenure is less well-documented but tends to fall into one of two broad categories: (1) government land, which includes settlement schemes as well ports and beaches, and (2) private land, including both freehold and leasehold tenure (including land held by absentee landlords). Many of the county's residents, however, live in informal settlements where land is formally owned either by private landowners (e.g. absentee landlords) or by the government. The government has been working to formalize some of these spaces and provide residents – many of whom have been on the land for generations – with either title deeds or other documents verifying their user rights, but the process is slow – due partly to lack of political will, corruption, and administrative capacity.

Overall, this case selection enables us to analyse how different land tenure systems and climate vulnerabilities intersect, shaping household- and community-level resilience strategies. While we focus on two specific regions within Kenya, we expect the findings to hold relevance for other developing countries where climate change is affecting local livelihoods – both urban and rural.

[6] Although technically leased from the government, large-scale ranches and conservancies are effectively managed as private ranches (land owners have leasehold rather than free-hold tenure).

3.2 Survey design

In partnership with a Kenyan research firm,[7] we implemented a household-level survey in Laikipia and Mombasa counties in March 2024. We used stratified random sampling in order to attain a survey sample that was, to the extent possible, representative of the county population (see Annex 1 for more details). We sampled from all subcounties in Laikipia and Mombasa counties respectively, as summarized in Table 1. Within each surveyed location, respondents were recruited through a random-walk protocol modelled after the Afrobarometer protocol for household survey sampling. In very rural locations where the random walk was not feasible due to large distances between households, enumerators interviewed a respondent after every 300 meters of walking in a designated direction from the polling station (or other designated starting point).

Table 1. Overview of survey sample (distribution of respondents by subcounty)

County	Subcounty	Survey resp.
Mombasa	Nyali	88
Mombasa	Mvita	64
Mombasa	Likoni	104
Mombasa	Kisauni	120
Mombasa	Changamwe	56
Mombasa	Jomvu	64
Laikipia	Laikipia Central	96
Laikipia	Laikipia East	96
Laikipia	Laikipia West	128
Laikipia	Nyahururu	152
Laikipia	Laikipia North	32
Total		**1000 survey respondents**

[7] The survey was conducted in partnership with the Institute of Public Opinion & Research – Kenya (IPOR-Kenya).

Our survey instrument consisted of 104 questions that helped measure our variables of interest, along with questions that measure relevant controls and other relevant confounders. We designed the questionnaire to produce observational data, using both attitudinal and behavioural questions. In each household, enumerators followed the Kish grid method to determine which individual over the age of 18 would be interviewed. To ensure gender balance, enumerators alternated between male and female respondents. Our survey sample is split evenly between our two sampled counties of Mombasa and Laikipia. It is also nearly evenly split between primarily rural and urban areas. In Annex 1, we present descriptive statistics and discuss how we measure key control variables. Below, we discuss how we measure the key concepts in our study.

3.2.1 Measuring land tenure

As discussed at the outset of this report, we conceptualize land tenure along three main dimensions: the land tenure system, the extent of land rights, and the perceived security of such rights. To measure each of these sub-dimensions, we rely on several questions from our survey. Table 2 below summarizes each of these sub-dimensions and their corresponding measures, while Annex 2 shows the distribution of responses for each of these three variables broken down by sub-county.

Table 2. Measures of Land Tenure

Sub-dimension	Variable	Measurement
Land tenure system	Category of land tenure	Communal, government, or private.
Land rights	Land rights index	Composite index measuring *bundle of rights*, from 0 (no rights) to 1 (full rights).
	Household holds title deed	1= title deed, 0 = no title.
Perceived tenure security	Fear of eviction	Perceived risk of being evicted (1-5 scale)

Land tenure system: In order to capture the land tenure system in which a respondent resides, we rely on a survey question that asks: "Land in Kenya is designated into different categories, including community-owned, government-owned, and private-land. How would you describe most of the land here in this location?" Respondents are presented with five options, which we collapse into three main tenure categories: community, private, and government. Across the sample, the most common reported land tenure system is private (72 percent of sample).

Importantly, private land does not by definition connote stronger tenure security than other tenure systems; it can include both legally registered and unregistered land. For instance, many people acquire user rights through informal land transactions (i.e. without the formal registration of the Ministry of Lands) or live or use land owned by someone else (e.g. landlord, corporation, or large-scale ranch or farms).

The second most common land tenure system is communal land, which is land held collectively by an ethnically or culturally defined group and is typically governed by customary rules and practices.[8] In our sample, 17 percent of respondents report living on community land. These rates tend to be higher where pastoralism is prominent. Notably, in Laikipia North, where 78 percent of respondents engage in pastoralism, 94 percent of report living on community land.[9] The third and least common tenure system among our sample is government land, which refers to land owned or held in trust by the

[8] Community land in Kenya, as defined by Article 63 of the Constitution, refers to land held collectively by communities based on ethnicity, culture, or shared customs. It includes land traditionally used or occupied by communities, land registered under group representatives, trust land managed by county governments, and areas designated for communal purposes such as grazing, forests, or shrines.

[9] Among the 30 people sampled in Laikipia north, only 2 people (6 percent of sample) believed they were living on private land.

national and county governments.[10] Only 11 percent of respondents across our sample indicated that they were living on government land, though rates are notably higher in Mombasa County.

It should be kept in mind that these statistics are estimates only, given that many people may not know the formal designation of the land on which they reside, and so responses represent their best guess. For instance, in Likoni subcounty (Mombasa) most of the land in this highly dense settlement belongs either to the government or private individuals (often a single absentee landlord). Yet because many residents have lived on the land for generations, they see it as their community or customary land, even if it formally lacks such recognition. Hence, while the question provides a rough estimate of tenure types, it is possible that people believe they have community or ancestral rights to the land, when legally, they may be squatting or residing on private or public lands.

Land rights: Our second main sub-dimension of land tenure is the extent of land rights, which we measure using two main variables. The first relies on a land rights index (LRI) that we created based on a set of questions asking whether the respondent has the authority to do any of the following to their land or house: Rent out land or property; sell land or property; use land or property as collateral; transfer land/property to a family member; and/or decide who will inherit land/property. The index is based on the mean values of the binary variable for each land rights dimension, where 0 represents the minimum value (no land rights or very low access to land rights) and 1 represents the maximum value (full land rights or very high access to land rights).

Importantly, there are several other components of user rights that we could have included in the index, such as decisions about which crops to plant or whether a person has the right to sell those crops.

[10] Government (i.e. public) land is defined by Article 62 of the Kenyan constitution, and includes unalienated government land, land owned or occupied by the state, land reserved for public infrastructure, national parks and forests (and other protected ecosystems), and in some cases, can include unregistered community land.

We did not include this particular dimension in order to make the LRI applicable to both rural and urban settings. Nonetheless, the index helps capture the respondent's "bundle of rights" (e.g., Schlager and Ostrom 1992), providing a multidimensional metric of land rights. Most respondents have a LRI close to 0 (very weak rights). The majority (60 percent) have a score below 0.2, while only 18 percent have an LRI score above 0.8, which would indicate strong ownership rights.

As a second measure of land rights, we create a binary variable for whether a household holds a title deed to their land. This measure is based on a survey question that asks – from among respondents who hold a document stating their user rights – "what type of document is it that your household holds?" Rates of title deed ownership were much higher among respondents in Laikipia subcounties compared to Mombasa. Notably, in Mombasa's Changamwe subcounty, not a single respondent held a title deed. The sub-county patterns of title deed status and LRI score mirror each other.[11] This is not surprising, given that having a title deed should, at least in theory, formalize and strengthen a land user's legal, economic, and social claims to the land. Hence, we do not assume these two measures to be independent of one another. Instead, we see the LRI providing a more active measure of land rights (a person's perceived sets of rights to make decisions), while having a title deed provides an objective measure of whether the state formally recognizes a person's tenure rights.

Perceived tenure security: Our third sub-dimension of land tenure is perceived security, which we measure using a survey question that asks about fear of being evicted.[12] While the survey asks about perceived (in)security in a few ways, we find that asking about fear of being evicted – rather than general perceptions of tenure security

[11] Even while there are similar patterns in title deed ownership and land rights index scores, the correlation between the two variables is only 0.35 (see more below), indicating a moderate correlation.

[12] Q58 asks: How often do you worry about someone else taking your land/house or demanding that you leave?"

– provides a more accurate assessment of one's certainty, or lack thereof, of tenure rights.

Importantly, while eviction fear is closely associated with lack of legal recognition to one's land, there are a host of other factors that can elevate perceived risk, even among people with legally recognized rights (i.e. title deed holders). For instance, in instances of violent conflict (e.g., episodes of election violence), crime, or gender-based violence, a person may be forcibly and violently evicted from their home or land, despite holding a title deed. An earlier interview with a farmer in Nakuru county – in Kenya's central Rift Valley, points to both the possibilities and limits of holding a title deed, absent a government willing and able to enforce a user's rights:

"I don't have complete trust with my title deed, when someone takes away my land it's like they take out the entire stem of a tree but they leave me the roots of the tree, that is how I think of it."[13]

The quote also points to the need to have multiple measures of tenure security, both objective and subjective. Indeed, our data indicate that formal tenure security is an unreliable proxy for both land rights and perceived tenure security. Notably, correlation analysis shows that our measures of perceived security (*land secure* and *eviction fear*) are only weakly correlated with formal measures of land tenure rights (title deed and land ownership). There is also a notably weak relationship between the land rights index and perceived tenure security. [14]

3.2.2 Measuring climate resilience strategies

To capture the different strategies of climate resilience and responses to climate threats that people may pursue, we focus specifically on questions from our survey that measure a person's propensity to

[13] Interview with farmer in Likia Farm, Nakuru, July 7 2012 (conducted by Kathleen Klaus).
[14] See correlation analysis in Annex 2, which shows the correlation between each of our land tenure variables.

engage in household-level or collective adaptive responses (outcome 1), to engage politically (outcome 2), or support violence in order to defend or re-claim resources (outcome 3). We designed these questions to capture both actual behaviour (whether an individual has engaged in a particular activity), and preferences (whether the respondent anticipates taking a particular action, or supports a particular strategy).

Importantly, the measures we describe and analyse are not mutually exclusive. Our primary interest, rather, is in identifying the extent to which our measures of land tenure affect the strategies that a person supports or pursues in order to mitigate against climate-related threats. We summarize these measures in Table 3 below. A detailed breakdown of the distribution of responses for each measure at sub-county level is provided in Annex 3.

Table 3. Measures of Climate Resilience Strategies

Outcome	Measure (*variable name*)	Scale
Household & collective adaptation	Changed farming practices and/or made improvements to structure in the past few years (*household adaptation*)	Yes/No
	Participated in community restoration efforts (*collective adaptation*)	Yes/No
	Preference for relying *only* on household members when preparing for natural disasters/ bad weather (*household only*)	Categorical (1-3); re-scaled
Political strategies	Joined political protest (*joined protest*)	Frequency (1-4) re-scaled
	Joined others to raise an issue (*raised issue*)	Frequency (1-4) re-scaled
	Interest in joining climate-related protest (*climate-related protest*)	Likelihood (1-5), re-scaled
Coercive strategies	Agrees that protection from climate change requires "taking back land occupied or taken by outsiders. (*coercive redistribution*)	Strength of agreement (1-5), re-scaled.

Note: re-scaled variables have been re-coded into binary variables (0/1).

Household and collective adaptation: Our first outcome of interest concerns the extent to which people engage in household-level or collective-level resilience strategies, as well as whether they are more likely to pursue household-level adaptive efforts over collective ones (or vice versa). The first variable, *household adaptation*, relies on a survey question in which the respondent is read a list of actions that people sometimes take in response to extreme weather.

To capture household-level responses, we construct a dummy variable that indicates whether the respondent, in the last 2-3 years, has either "changed farming practices (e.g., adjusted crop type or planting season)" and/or "made improvements to [their] house/ structure." This question provides an important measure of a person's agency in responding to climate stressors; how households use their resources, knowledge, and decision-making capacities to adapt to environmental challenges. Moreover, in contrast to questions that measure perceptions or intentions, this measure provides an observable measure of behaviour – evidence of households translating awareness of climate risks into concrete action.

To measure the likelihood of engaging in collective resilience efforts – rather than household-level measures alone – we rely on another response to the same question. Specifically, the variable *collective adaptation* measures whether a respondent has "worked together with [their] community to restore degraded areas, or to make repairs or improvements to infrastructure." While our survey included a number of different measures for community-level adaptive strategies, we use this question because it asks about past behaviour, which tends to be a slightly more reliable predictor that asking about anticipated behaviours in the future. A third related measure (*household only*) asks respondents whether, when faced with climate threat, they are more inclined to rely "only on my households' resources and actions" or "community members."[15] The question measures a person's perceptions and preferences about how best to

[15] The respondent can also indicate that they have no preference between the two.

prepare for climate challenges, and in particular, their beliefs about the relative efficacy of household versus community-led strategies.

Political strategies: The second broad category of resilience strategy that we measure are those in which individuals and communities move beyond household-level or even community-level adaptive strategies, seeking potentially more contentious strategies that engage political actors or the state. While there are many ways of measuring political engagement as a way of addressing climate change, we focus on three specific survey questions. The first two are retrospective, asking whether a respondent has *joined a protest* or gotten together with others to *raise an issue*.

Importantly, neither of these questions ask specifically about whether such actions were taken with climate resilience in mind. Protest participation is a strong indicator of activism and willingness to engage in risky collective action. Raising an issue with others, meanwhile, captures a less formal measure of political engagement compared to protest participation, but may nonetheless capture collective political behaviour that is often central to community-driven climate resilience efforts. Hence, while these two measures do not directly measure climate resilience, they do capture the capacity for collective action and political engagement – including its high-risk forms – that are often prerequisite for addressing shared challenges like climate threats. The third measure, by contrast, provides a more direct measure of a climate-related response, asking how likely a person is to join a *climate-related protest* in the future. While political protest is very rare in our sample – only 6 percent have actually participated in any protest activity – over 40 percent of the sampled population have either gotten together with others to raise

an issue (44 percent), or see themselves participating in climate protests in the future (43 percent).[16]

Coercive strategies: Our third category of resilience that we aim to capture is the willingness of people to support (or actively pursue) violent and coercive strategies of resilience – those which involve taking away land, territory, and other livelihood assets from other households or communities in order to defend or expand the set of resources available to one's household or community. There are many inferential challenges involved in asking people about their engagement in or support for violence, especially in the context of an observational survey.

Rather than asking respondent directly about their support for violence, we ask whether they support a set of statements that imply but do not directly specify the use of violence. We rely specifically on survey question that asks whether a respondent agrees with the statement: "The only way we can protect ourselves from changing climate and extreme weather is to take back land that has been occupied or taken by outsiders." This *coercive redistribution* statement plays on two narratives that are prevalent in many parts of Kenya, and which have animated election and communal violence in the past (Klaus 2020, Boone 2011). The first is the idea that other groups (i.e. "outsiders") have taken land from natives or rightful owners. The second idea suggests that in order to rectify past injustices (e.g., land theft or colonization of lands), violence may be a legitimate strategy of re-claiming "stolen" land or territory from current occupants. While most people reject the statement (i.e., somewhat or strongly

[16] Protest participation in our sample is similar to the Afrobarometer (2023) country-level average of 7 percent. Our survey questionnaire included other questions about prospective forms of political activism around climate threats. Yet for these questions, a large majority of the sample (over 80 percent) indicated in the affirmative. This lack of variation in the outcome makes it difficult to model meaningful relationships, and so we excluded these questions from the analysis. To see these questions, refer to Q90 and Q92 in the questionnaire. We avoid these questions in part, because a highly skewed dependent variable, especially using logistic regression, can produce unstable estimates.

disagree), 13 percent of respondents strongly agree or somewhat agree, and 10 percent of the sample indicate their ambivalence.[17]

3.3 Qualitative data and ethical considerations

To complement the quantitative data and gain better insights into how people think about climate change, land tenure, and adaptation, we conducted follow-up focus group discussions (FGDs) in different sites within Mombasa and Laikipia counties with the aim of capturing relevant variation along our key variables, in line with the case study discussion above. Table 4 below provides an overview of the specific composition and location of each of the focus groups.

A few of the focus groups only included women. This was an important strategy to ensure that we captured women's reflections and experiences as well, aware that research and fieldwork experience show that in more conservative and patriarchal communities – as many pastoralist communities tend to be – women are often more hesitant to speak out when men are also present (Stewart and Shamdasani 2014; Kenny et al. 2022). The observations of the research team indicated that women were much more comfortable speaking out in the women-only setting, in particular about land issues which are traditionally considered a male domain.

17 We treat such ambivalence for the use of violence as weak support, and hence, when we recode responses into a binary variable of support or non-support, we code ambivalent responses as 1 (support for violence).

Table 4. Overview of focus group discussions

FG #	County	Location	Group composition	No. of participants
1	Mombasa	Mwembe Legeza	Mixed gender and age	9
2	Mombasa	Changamwe	Mixed gender and age	9
3	Laikipia	Ilpolei/Munishoi	Pastoralists (mixed gender)	19
4	Laikipia	Ilpolei/Munishoi	Pastoralists (women only)	8
5	Laikipia	Segera	Agropastoralists (mixed gender)	7
6	Laikipia	Mukogodo	Smallholder farmers (women only)	7
				Total: 59

We collaborated with a local research firm to organize and carry out the FGDs, which were held in Kiswahili or a mix of Kiswahili and English. The discussions were guided by a few broad questions aiming to elicit discussions on how respondents interpret the effects of climate change in their everyday lives; how they perceive their own land tenure security, and what factors they emphasize as most important in this regard; and how (if at all) they respond, adapt, or organize to strengthen their resilience and preserve their livelihood in the face of climate-related threats. All discussions were recorded and carefully transcribed, translated into English.

Given the sensitive nature of some of the questions asked within this study, risk assessment and ethical research conduct have been key prioritized throughout the project period, and all interviews (survey interviews and focus groups) were conducted on the condition of informed consent. The study has undergone review by the Swedish Ethics Review authority, as well as Kenyan authorities, with local permits obtained ahead of data collection in line with Kenyan research standards. We carefully considered which questions we could ask in the interviews and in the survey in order to obtain

information on the subject while minimizing risk of exposing the research subjects to discomfort. During the survey training, we held a thorough discussion of the questionnaire with the enumerator team, and a pilot study was carried out. Insights from these discussions led us to revise the framing and wording of certain questions.

In order to protect the privacy of our respondents, we did not collect any personal information (name, address or similar). All collected data (survey data as well as focus group recordings, notes and transcripts) was as soon as possible transferred to password-protected servers. The safety of our survey enumerators and research assistants was also a key consideration. We carried out continuous risk analyses together with our partners, before, during and after data collection, and the enumerators had continuous contact with a team leader and with the local company's project manager, in order to debrief and receive support in the event of any unpleasant experiences.

4 Livelihoods and climate exposure in Laikipia and Mombasa

Both Laikipia and Mombasa counties are highly vulnerable to the impact of climate change. In Laikipia, like other arid and semi-arid lands (ASALs) in the region, climate change is noticeable and has had a tangible impact on local livelihoods and economy (Ndiritu 2021). With increasingly prolonged droughts and winnowing pasture lands, pastoralist communities are grazing their livestock on the lands of white-owned ranches, conservancies, and farming communities (ibid.; Letai & Lind 2013). This encroachment, which pastoralists see as necessary for survival, is leading to more frequent conflicts – sometimes violent – between pastoralists and other land users.

The fragility of the landscape, and the population's dependence on the land make the county especially vulnerable to climate-change induced drought and flooding. In coastal Mombasa, climate change has intensified extreme rainfall events, frequently overwhelming the city's inadequate drainage and waste management systems, leaving informal settlements particularly vulnerable to flooding (Ngome & Yeom 2024). Additionally, rising sea levels threaten shoreline communities, displacing residents and increasing competition over secure housing. [18] In sum, both counties feature high climate vulnerability. In this section, we describe how our respondents perceive and think about climate change.

4.1 Patterns of climate exposure

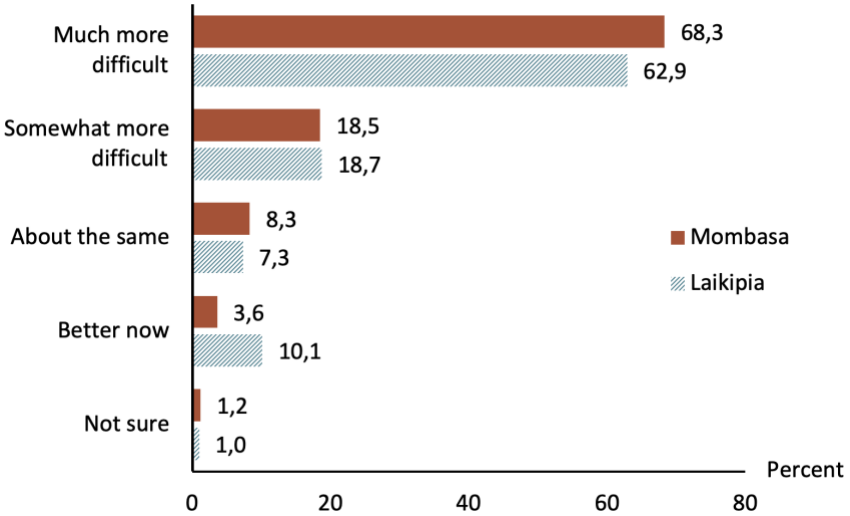
A key assumption in our decision to sample Laikipia and Mombasa counties was that, even while facing distinct ecological challenges,

[18] See CORVI Risk assessment for Mombasa: https://www.stimson.org/2021/corvi-risk-profile-mombasa-kenya/

people within each county nonetheless faced similar levels of climate change exposure, or at the very least, similar perceptions that exposure to climate change poses a tangible threat. Confirming this expectation, our survey responses show clearly that a majority of our respondents are perceiving the impact of climate change in their daily lives. In order to measure climate change exposure, and the degree to which it indeed varies between and within our sampled counties, we rely on three of our survey questions.

The first measure asks respondents to assess the change in climate conditions over the last 5–10 years. Results indicate that a vast majority of respondents perceive a significant change, with 66 percent of the sample indicating that weather has become "much more difficult." Figure 1 below shows the distribution of responses by county. It illustrates that the vast majority of respondents indicated that weather conditions had become much or somewhat more difficult in recent years; respondents in Mombasa to a higher extent said that conditions had become much more difficult (68 percent compared to 62 percent in Laikipia). Meanwhile, a higher share of respondents in Laikipia (10 percent compared to 3.6 percent) indicated there had been some improvements in weather conditions.

Figure 1. Perceptions of worsening weather conditions



We also asked respondents specifically about experiences of drought and flooding. We asked: "in the last 2–3 years, to what extent has your household been affected by flooding?", repeating the same question but asking about drought. Responses illustrate that the two counties face different climate-related challenges: Flooding is a bigger concern in Mombasa, and drought is more prevalent in Laikipia. Across the sample, flooding appears to be far less of an issue than drought. 93 percent of Laikipia respondents indicated that they were not affected, or only slightly affected, by flooding.

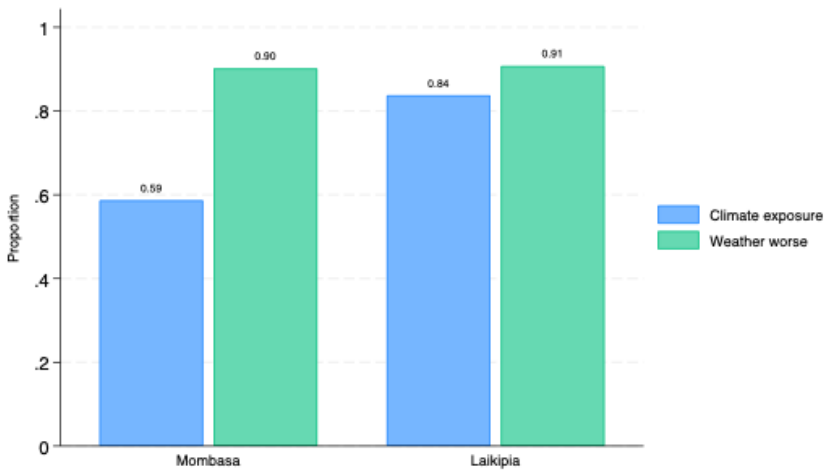
In Mombasa, flooding is a more prevalent issue, but even here, 70 percent of the sample indicated that they were not affected or only slightly affected. However, important to note here is that the survey was implemented just before devastating floods occurred across much of the country.[19] By contrast, and not surprisingly, 60 percent of respondents in Laikipia have been affected by drought. In

[19] The floods were particularly severe in 2024, and affected 43 of Kenya's 47 counties, including Mombasa and Laikipia. The floods led to widespread damage and loss of lives, with at least 294 people killed by the floods and 55,000 people displaced according to the Kenya Red Cross (KRC 2024).

particular, among pastoralist or agro-pastoralist communities, 70 percent report being significantly or severely affected by drought in the last 2–3 years.

In our regression analysis (Chapter 5), we rely on two simplified versions of these measures. The first (*weather worse*) is a binary variable denoting whether the respondent indicated that weather has become "much more difficult" in the first question described above. The second (*climate exposure*) combines responses about flood exposure and drought expose to measure weather a household has been adversely affected by either (or both) of these hazards. 71 percent of respondents reported having been adversely affected by floods and/or drought, with a higher proportion in Laikipia than Mombasa (84 vs 59 percent), as shown in Figure 2 below. The proportion of respondents in each country who remark that the weather conditions have become more difficult over the last decade is about the same (around 90 percent).

Figure 2. Perceptions of climate exposure and worsening weather patterns



Our survey thus clearly demonstrates that residents in both Mombasa and Laikipia are acutely aware of the effect and future threats of climate change in their everyday lives. Our focus group

discussions (FGDs) further reinforce the picture that local communities are highly aware of the impact and threat of climate change and erratic weather. Mirroring the survey findings, lived experience and concerns about drought were particularly present in our focus groups in Laikipia. In Mombasa, interviews highlighted the impact of floods, but also mentioned broader climate change impacts, as well as how urban development and congestion has made the city more vulnerable.

4.2 Local livelihoods and environmental challenges

Our focus group interviews underline the concrete ways in which climate change and climate variability impact urban and rural residents across our two case study counties. The FGDs also illustrate how local livelihoods play an important role in how people experience and interpret climate-related threats. In pastoralist areas of Laikipia, the main issue is access to grazing land, which is severely affected by prolonged droughts, but also floods. In farming areas, both droughts and floods are an issue as they affect harvests and soil health. In addition to extreme weather, increasingly erratic weather patterns are also major concern, as it affects the ability to plan and plant at the right time. In the urban focus groups, bringing together respondents with more diverse livelihoods, the discussions cantered more on how climate change impacted health and living conditions, but also how floods often impeded economic activities.

In Laikipia, we conducted focus groups in three locations. The first, Il Polei, is a group ranch managed by the Maasai community.[20] Group ranches represent a form of communal tenure. The ranch

[20] Group ranches, which represent a form of communal land tenure, are a collectively owned and managed landholding, legally registered under a group title deed. In Kenya, group ranches are typically composed of pastoralist communities who share land for grazing, settlement, and resource use. Introduced in 1968, group ranches have been means for the government to delineate land-use to protect the rights of Maasai people and other pastoral groups.

forms part of the larger Naibunga conservancy[21] and serves as a crucial wildlife corridor, with the Maasai community playing an active role in preserving the environment and its diverse species. The area is remote and has been increasingly affected by prolonged droughts, reducing pasture availability and water resources. These conditions have made it more difficult for livestock to survive, leading to frequent disputes over grazing land. Respondents also note increasing challenges between humans and wildlife, with the greatest threats coming from elephants.

The second, Ngenia Village (Mukogodo Ward), is a mixed livelihood area comprising both farmers and agro-pastoralists. Focus group participants, all of whom were women, identified themselves as small-scale farmers. The region has been experiencing erratic rainfall and increasing temperatures, making traditional farming cycles unpredictable. Farmers have reported more frequent crop failures and soil degradation, affecting food production. As one respondent remarked, *"Sometimes we plant, and then the rain fails to come. In the past, it used to come at the end of March or in April, and it would come briefly, then stop."* Her fellow FGD respondents affirmed this, stating in unison, "the living conditions have deteriorated completely."[22]

The third, Segera, is a semi-urban settlement where residents engage in a mix of farming, trading, and livestock raising. Our respondents highlight the unpredictability of recent weather as a specific challenge, along with prolonged dry spells and flash floods, which make both agriculture and infrastructure development challenging. Soil erosion and decreasing groundwater levels have further contributed to uncertainty in farming and livestock rearing. These challenges are felt equally, even if in different ways, among both herders and farmers. As a herder explains,

21 The Naibung'a conservation area comprises three community conservancies that are independently managed. Each conservancy comprises of three community group ranches.
22 FGD, Mukogodo, R1 and unanimous agreement.

"the drought has devastated everything because it persisted for a long time. So, when the rain finally came, it affected me because nothing survives after such a long drought."[23]

A farmer adds,

"Okay, I am a farmer. With the heavy rainfall, the water was too much, carrying away all the nutrients [from the soil]. So, you find that the crops we planted, all the nutrients were washed away, so the plants are not doing well."[24]

In Mombasa County, we held two separate focus groups. The first was in Changamwe, which is an ethnically diverse, densely populated and low-income urban area, where residents pursue different urban economic activities and unemployment is high. The primary climate-related challenges include severe flooding, poor drainage systems, coastal erosion, severe heat, and destruction of fishing stock. Many residents expressed frustration over frequent flooding, which disrupts daily life, including the ability of children to attend school, and damages homes. In the words of one respondent:

"Other than diseases, climate change also affects our development. When it floods or rains hard, there are people who can't go to work. It even affects the children's education."[25]

We held the second Mombasa focus group in Mwembe Legeza, which is a peri-urban settlement where residents rely on a range of incomes sources, including fishing along the coast, small-scale farming, and trading. The main climate-related challenges highlighted by respondents include severe flooding, saltwater intrusion, and deforestation, which have worsened in recent years due to rapid urbanization – including into swamp and riparian lands – and weak land governance. Respondent also describe declining crop yields, including from mango trees and coconut palms, and declining fish stocks in

[23] FGD, Segera, R3.
[24] FGD, Segera, R4.
[25] FGD, Changamwe, R5.

coastal waters – foods that have historically sustained coastal communities.

In sum, our data – both from our representative household survey, and from focus group discussions in the two counties – underline that to residents in Laikipia and Mombasa, climate change is tangible and represents a real threat to local livelihoods. Ultimately, the central question in this report is how people adapt or respond to these highly salient climatic threats, and how these responses may depend on land tenure. We turn to this question in the following two chapters.

5 Land tenure and climate resilience strategies: Survey findings

How does land tenure shape individual- and community-level resilience strategies? In this section, we present results from regression analysis that tests the relationship between dimensions of land tenure and strategies of climate resilience. To recall, we focus on three broad categories of such strategies: a person's propensity to rely primarily on one's own household or cooperate with others beyond their household to adapt (outcome 1), to engage politically (outcome 2), or support violence in order to defend or re-claim resources (outcome 3). Broadly, our results point to the important role of land systems, rights, and security in shaping the resilience strategies that people support or pursue, with a person's land rights, as captured by a person's land rights index score, having the strongest association with resilience behaviours and attitudes.

We use regression analysis because it allows us to isolate the relationship between key variables and outcomes of interest, even when other factors are at play. Specifically, by using mixed-level logistic regression, we can account for the nested nature of our data (i.e. individual respondents within subcounties and counties) while controlling for potential confounding variables. This ensures that we can better estimate the relationships between our explanatory variables related to land tenure, and climate resilience outcomes, while holding other variables constant.

By accounting for variation both within and between levels of analysis, this method minimizes bias and helps us understand how factors operate across different contexts. In specifying each model, we also include random effects at the subcounty level. The inclusion of random effects helps account for the fact that people in different subcounties (or local areas) might experience different environments, opportunities, or challenges. Even if two people have the same individual characteristics, their outcomes might differ because

of the area in which they reside. By including subcounty and polling station as a random effect, the model adjusts for these local differences, enabling us to better understand how individual factors (like land rights) influence climate resilience strategies. It also helps avoid drawing biased conclusions from regional patterns.[26]

In all our statistical models, we control for a series of factors that are likely to shape both land tenure and climate adaptation, including poverty level, access to services, gender, education level, and whether the respondent lives in an urban or rural area. Annex 1 provides descriptive statistics for all the variables used in each of our models. In estimating the effects of each model, we include the same set of controls. The full results of each model that we report here are available in online Annexes 4–10.

The table below summarizes our main statistical findings across each of our model estimations. Specifically, it indicates where we observe statistically significant associations that are either positive (+) or negative (-), and denotes non-statistically significant findings as well (ns). In the subsequent sections, we discuss these findings in detail, including how we can understand the patterns we observe.

[26] More so, the inclusion of random effects helps control for regional differences without needing to model each subcounty individually. It improves the model's accuracy by accounting for the hierarchal structure of the data, where individuals are "nested" within subcounties, wards, and villages.

Table 5. Summary of statistical relationships between land tenure variables and climate resilience strategies

Outcome 1

	Household adaptation	Collective adaptation	Household preferred
Private land	ns	-	+
Communal land	ns	ns	ns
Gov't land	ns	+	-
LRI (score)	+	+	-
Title deed	+	+	ns
Eviction fear	ns	ns	ns

Outcome 2

	Joined protest	Raised issue	Climate protest
Private land	ns	ns	ns
Communal land	ns	ns	+
Gov't land	ns	ns	ns
LRI (score)	+	+	ns
Title deed	ns	ns	ns
Eviction fear	ns	+	+

Outcome 3

	Supports violence
Private land	ns
Communal land	+
Gov't land	ns
LRI (score)	ns
Title deed	ns*
Eviction fear	+

[+] = Positive and statistically significant relationship.
[-] = Negative and statistically significant relationship
[ns] = No statistically significant relationship.

5.1 Results: household and collective adaptation

In this section, we focus on the relationship between our land-related variables and our three measures of individual and collective-level adaptation.

Household adaptation: Recall that our first variable, *household adaptation*, measures whether a person has made changes to their home (i.e. farm or dwelling) meant to help insulate their household from adverse weather. In our survey, people in Laikipia are on average more likely to have made resilience-enhancing changes compared to residents in Mombasa (68 vs. 36 percent; see Annex 3). So how, if at all, do our three land related factors help predict a person's likelihood of making such changes? As column 2 in Table 5 above summarizes, two variables are strongly and positively associated with the likelihood of making resilience-enhancing changes at the household-level: a person's "bundle of land rights" as captured by their LRI score, and whether or not they have a title deed to their land. Full results are provided in online Annex 4.

Taking the LRI score first, results from our regression analysis shows that as a person's land rights score increases, so too does their likelihood of engaging in household-level adaptation. Specifically, if a person's land rights score increases from 0.25 to 0.35 (a 10-percentage point increase on the scale), their odds of engaging in household-level adaption increases by 10 percent – holding all other variables constant.[27]

In substantive terms, we can interpret these results using predictive margins, which show the predicted probability of household-level adaptive measures at different levels of the land rights index (holding all other factors constant). For example, when a person's LRI score is zero (i.e. no rights), the predicted probability of nonetheless

[27] Recall that the LRI index is a scale from 0 to 1, where the mean value across our sample is 0.25.

engaging is household adaptation is 46 percent. Yet as a person's LRI score increases to 0.5 (moderately strong land rights), their predicted probability of making such changes increases to 56 percent, and at the highest value (1), it reaches 65 percent. The strength of this relationship, moreover, is more or less the same in both counties.

Having a title deed, meanwhile, has a similarly strong relationship with household adaptation – people with title deeds are significantly more likely to make resilience-enhancing changes compared to those without titles. In substantive terms, a person without a title deed has, all else equal, a 46 percent predicted probability of making household-level changes. This probability increases to 61 percent for those who hold a title deed to their land, i.e. a 33 percent increase in probability. We do not find any evidence that the form of land tenure regime significantly correlates with the likelihood of household adaptation. While private land tenure has a positive correlation with our outcome, and communal and government land have a negative correlation, these effects are not statistically significant. We also do not find any significant relationship between fearing evictions, and the likelihood of having taken household-level adaptive measures.

In sum, while our results do not indicate a statistically significant relationship between land tenure or perceived security on household-level adaptation, a person's land rights – measured by their LRI score and having a title deed – are strongly associated with a higher likelihood of making household-level changes to improve resilience. This finding aligns with a large literature, especially in development economics, which suggests that people with tenure security – and title deeds in particular – are more likely to invest in their landholdings, including investments in climate-smart agricultural practices (e.g. Castro and Kuntz 2022; Goldstein and Udry 2008).

Collective adaptation: In our second set of models, we focus on whether tenure-related variables affect collective adaptation, measured here by whether an individual has participated in collective restoration efforts meant to improve a community's resilience to climate threats. Across the sample, nearly half (49 percent) of

respondents indicated that they had engaged in community restoration efforts: 56 percent in Laikipia and 42 percent in Mombasa. Broadly, and as Table 5 above indicates, living on private land is negatively associated with engaging in collective resilience efforts, while living on government (i.e. public) land, having a higher LRI score, and having a title deed are all positively associated with engaging in collective restoration efforts. The full results are available in online Annex 5.

More specifically, an individual living on private land is 10 percentage points less likely to have participated in collective restoration activities compared to someone living government or communal land.[28] Meanwhile, moving from no land rights (LRI score=0) to very strong rights (LRI score =1), increases a person's probability of engaging in collective restoration by 23 percentage points (44 to 67 percent). Similarly, a person who holds a title deed to their land is 10 percentage points more likely to engage in collective efforts compared to someone who does not (57 vs. 47 percent). In some regards, these findings appear contradictory. They suggest that while privately held land, which is often assumed to come with stronger individual land rights, discourages collection action around climate resilience, having strong land rights appears to encourage collective action. The decoupling of the land tenure system and tenure rights here is important.

While we can only speculate, we suspect a few factors may be at work. The first is that people living within private tenure systems may have stronger incentives to invest in their own homes or properties – efforts that may pull them away from communal efforts. We probe this explanation further below, where we explicitly explore the preference for one strategy over the other. In addition, private land users may feel less obligated to work collectively, partly because they may seem themselves as having less at stake compared to people

[28] Calculations based on predicted probabilities, where someone living on private land is 10 percentage points less likely to have participated in collective restoration compared to people living in other tenure systems (48 vs. 58 percent).

living on public or communal lands, where land and resource governance may be more in the public domain.

A third explanation may be that social capital and community bonds are weaker in spaces of private land tenure, making it harder for neighbours and community members to resolve the collective action problem. Yet while private tenure may be associated with lower social capital, existing research points to the ways that tenure security increases social capital (Leviten-Reid and Matthew 2018). Strong social capital may also be endogenous to stronger land rights. That is, communities that are able to demand land rights recognition from the government may have higher levels of social capital to begin with. While our aim is not to disentangle the relationship between tenure security and social capital, that these factors tend to correlate helps explain why tenure security – rather than tenure form – may be a better predictor of collective action around climate resilience. Our focus group data, discussed in Chapter 6, further develops this argument.

The table below shows the interaction between private land and having a title deed. Notably, it shows that the highest probability of engaging in collective restoration is among people not living on private land, but who nonetheless hold a title deed (68 percent).[29] Meanwhile, people living on private land with a title deed are 13 percentage points more likely to engage in collective efforts compared to those who do not hold a title deed.

[29] For example, there any many instances of de facto privatization of government land, where people hold title deeds, even though the land technically belong to the government. The informal settlement of Kibera is one such example. People may also have title deeds to land in publicly protected forests (often issues illegally), or on group ranch land (communal land) that has been sub-divided and titled, even though not all subdivisions are fully privatized under law.

Table 6. Probability of engaging in collective restoration based on private tenure and title deed ownership

	Non-Private Land	Private land
Without title deed	0.56	0.43
With title deed	0.68	0.56

Note: Results are statistically significant (p-value < 0.001)

Taken together, we suggest that while, on average, private tenure may incentivize people to prioritize household-level adaptive strategies over collective efforts, having strong tenure rights (as measured by LRI score or title deed) also increases a person's sense of agency and efficacy, their connections with others, as well as their rootedness to a place. In other words, strong land rights may work to embolden people to be more ambitious in their resilience efforts – mov-ing beyond their own household toward more community or collective strategies.

Household only: Our third set of models estimates the relationship between our land variables and the preference for relying "only on one's household" when addressing climate-related threats. As we explain previously, this variable (*household only*) is distinct from our first measure of household resilience in that it captures a person's preference for one type of strategy over another, and specifically their preference to rely primarily on household members.

Across the sample, 18 percent of respondents preferred to rely only on their own household, 58 percent preferred to work with their community, while 23 percent indicated both as equally preferable. Yet there are notable patterns in sub-county-level variation. For instance, within Mombasa County, 40 percent of respondents in Kisauni sub-county indicated a preference for relying only on other household members. Yet in the adjacent sub-county of Jomvu, only 2 percent of respondent indicated such a preference. While land-related factors alone cannot explain such variation, they are likely part of the story. Notably, a greater proportion of people in Kisauni

live on private land compared to Jomvu (88 vs. 68 percent) and have title deeds (22 vs. 13 percent).

While we don't aim to prove a causal relationship, we expect – in line with the analysis of our preceding two variables – that private land ownership will tend to correlate with a preference for more private (i.e. household-level) resilience strategies over more collective efforts. Indeed, and as Table 5 above and the full regression tables in online Annex 6 indicate, living on private land is positively associated with a preference for household-only resilience strategies, whereas living on government land is negatively associated with such a preference. In substantive terms, people living on private land have a 6-percentage point higher probability of preferring resilience strategies that *only* involve household members compared to people in other tenure systems (18 vs 12 percent). Living on government land has the opposite effect, with people living on government land being 9 percentage points less likely to opt for "household only" strategies compared to people living within other land tenure systems (9 vs. 18 percent).

In addition to the tenure system, land rights, as captured by the LRI index, is also significantly associated with a person's preference for household-level versus more collective resilience efforts. In particular, moving from the lowest land rights score to the highest (i.e. very weak to very strong rights), a person's probability of wanting to rely only on their own household drops by 8 percentage points (from 18 to 10 percent probability). By contrast, we do not find any statistically significant association between fear of evictions, and the likelihood of preferring household-level versus more collective resilience efforts.

In sum, our findings indicate that while private tenure alone encourages a more individual-level approach to climate resilience, living on public lands discourages such insularity, instead encouraging more collective responses. People with weak land rights living on private land – where social capital and perceived agency tend to be low – are the most likely to pursue resilience strategies

that rely only on their own households. While the effects we find here are not dramatic (though statistically significant), they provide important clues into the ways that land tenure systems and tenure security may interact to shape the local foundations of self-efficacy, social trust, and collective action capacity – factors that help explain the types of climate resilience or adaptive strategies that people are likely to pursue.

5.2 Results: political engagement

This section summarizes a set of models that estimate the effects of our land variables on different forms of political engagement. Importantly, and as we explain previously, only one of the three variables we examine in this section – participation in climate-related protests – directly measures political engagement as a climate resilience strategy. The other two – protest participation and getting together to raise an issue – are more general measures of political engagement. We nonetheless report these findings, as we think that where people engage in such behaviors, the likelihood for translating these skills and capacity into strategies of resilience is high. Full results for these three outcomes are provided in online Annexes 7–9.

Protest participation: As our summary table (Table 5) shows, the only statistically significant predictor of past participation in political protest is the strength of a person's land rights, as measured by their LRI score. While the probability of participating across the sample is low (only 10 percent of all respondents have engaged in protest), this probability is more than twice as high for people with very strong land rights compared to people with weak or no land rights (11 vs. 5 percent). It is also worth noting that while rates of protest participation are low overall, they are much higher in Laikipia than Mombasa. This trend counters conventional wisdom, which suggest that protest is more likely in urban areas, in part because the barriers to collective action are lower due to denser social ties, higher levels

of education, and ease of communication which all facilitate mobilization (Eisinger 1973; Dorward and Fox 2022).

Raising an issue: In these models (see online Annex 8), two variables appear statistically significant – land rights score and perceived tenure security (i.e., fear of eviction). Specifically, we find that people with very strong land rights, based on the land rights index, have a 14 percentage points higher probability of getting together to voice an issue than people with very weak rights (55 vs. 41 percent). At the same time, people who fear eviction are 8 percentage points more likely to raise an issue compared to people who do not fear eviction (50 vs. 42 percent).

In some regards, these findings seem to contradict one another: that strong and weak land rights both predict collective organizing to raise an issue. But two distinct mechanisms are likely at work. On the one hand, people with strong land rights (as measured by LRI index) may feel a greater sense of agency, both politically and socially, and hence, may be more inclined to participate in local politics and mobilizing efforts. By contrast, those who fear eviction may feel a stronger sense of urgency and grievance, and hence, may be more motivated to politically engage, especially around strengthening their land rights – often by urging for formal recognition or title deeds (Hassan and Klaus 2023).

Climate protest: Our third measure of political engagement is the only one that explicitly analyses political engagement as a response to climate threats. Two land-related variables are statistically significant. The first is communal land tenure. As Model 2 online Annex 9 indicates, people living on communal land tenure are more likely to say they are likely or very likely to engage in climate-related protests in the future. In substantive terms, they have a 10 percentage points higher probability of thinking they will participate in climate-related protest compared to people who do not live on communal land. In addition, people who fear eviction are 11 percentage points more likely to say that they will participate in a climate-related protest in the future, compared to those who do not fear eviction.

What might explain these two findings? First, it's important to note that our models control for possible confounders. In particular, we control for different livelihood sources, including pastoralism, climate exposure, and county, yet none of these controls are statistically significant. This gives us greater confidence that there is something about the communal land tenure environment itself that is driving our results. In particular, like our previous discussion, we suspect two mechanisms to be relevant – one about agency and collective action capacity, and the second about grievance – both of which combine to make participation in climate protest seem more reasonable and thinkable. On the one hand, contexts of communal tenure may benefit from deeper institutional norms of collective decision making and governance, along with a strong sense of shared collective identity, factors that can facilitate collection action like climate protests. Equally, people living on communal land might perceive both their rights to land and their livelihood to be especially precarious. This would also help explain why those who fear eviction are especially likely to say they will join a climate protest in the future. More so, the strong sense of collective identity can heighten a sense of victimhood and injustice. In this regard, for people living on communal land, climate-related protests may appear to be an especially plausible and important action to amplify their voices and demands.

In sum, the underlying social and institutional dynamics of communal tenure systems – such as shared risks, collective identity, and norms of cooperation – may play an important role in fostering participation in climate-related protests. Importantly, however, fear of eviction has an even stronger association with the likelihood of participating in a climate-related protest. This suggests that while communal land tenure might foster collective action norms that facilitate climate protest, people who fear eviction may see climate protests as an important way to defend their land and livelihood and demand political (or policy) change.

5.3 Results: support for violence

We turn now to exploring the relationship between land tenure and support for violent strategies of climate resilience. To recall, we asked respondents whether they agreed with the statement: "'The only way we can protect ourselves from changing climate and extreme weather is to *take back land* that has been occupied or taken by outsiders". Online Annex 10 shows the results from each model specification. We refer to our outcome of interest as "support for coercive redistribution." The survey question does not provide a direct measure of support for violence. Indeed, many respondents who agree with the statement would likely deny that they support violence outright. The measure does, however, provide a proxy for supporting a set of actions that are contentious, anti-outsider, and sometimes violent.

We find that the same variables that predict a willingness or interest to participate in climate protests – living on communal land and fearing eviction – also predict support for coercive strategies. Specifically, people living on communal land have an 11-percentage point higher probability of agreeing with the pro-violence statement compared to others (33 vs. 22 percent). One possible explanation, as mentioned in the previous section, is that people living within communal land are likely to have a stronger sense of group identification, not least of all because their claims to land and resources are linked to their ethnic group membership (Klaus 2020). This strong group identification, coupled with economic and environmental precarity and political manipulation of identity, provides a combination of incentives and capacity conducive to contentious mobilization (Hillesund and Østby 2023).

Like the previous analysis, our statistical results for eviction fear provide especially strong evidence that tenure insecurity shapes views about the acceptability of violence as a strategy of climate

resilience.[30] This finding aligns with a number of other studies that have linked fears of losing land to the use or legitimization of violence (McNamee 2018). In particular, where land claims are ambiguous or uncertain, and the perceived risk of expropriation is high – either by the state or other private actors – violence can become a way of defending, litigating, or reclaiming land or territory (Albertus and Klaus 2025). Relatedly, where people feel land insecure – especially when an upcoming election throws their land claims into question – they may be more willing to fight on behalf of a politician who promises to protect or promote their land claims (Klaus 2020, Boone 2014).

Perceived land insecurity (eviction fear) also interacts with land tenure systems in notable ways. As table 7 below shows, a person's probability of agreeing with the "pro-violence" statement is 23 percentage points higher when they both fear eviction and are living on communal land compared to when they don't fear eviction and are not living on communal land.

Table 7. Effects of communal land tenure and eviction fear

	Not communal land	Communal land
Does not fear eviction	.19	.28
Fears eviction	.30	.42

Predictive margins, *** p < 0.001

By contrast, we do not find strong evidence that land rights (captured by the LRI) predicts the likelihood of agreeing with the coercive redistribution statement (the coefficient is negative, but not statistically significant). However, when we separate out effects between urban and rural residents, we find that higher LRI scores do indeed diminish the likelihood of supporting coercive redistribution, but only for rural residents. By contrast, LRI scores have no significant relation-

[30] Eviction fear has a p-value of 0.002 compared to communal land tenure, which has a p-value of 0.011

ship with an urban resident's views of coercive redistribution. We show these differences in Table 8 below.

Table 8. Effects of land rights in urban and rural areas

	Rural area	Urban/mixed area
LRI = 0	.28	.24
LRI = 0.5	.22	.26
LRI = 1	.17	.28

Predictive margins, *** p < 0.001

Having a title deed, however, does appear to slightly reduce one's probability of agreeing with the statement. While this effect is not statistically significant at conventional levels, it is significant at the 10 percent confidence level, and indicates that holding a title reduces the probability of agreeing with the statement by about 6 percentage points (20 vs. 26 percent).

5.4 Additional factors shaping resilience strategies

In our analysis thus far, we have focused on the explanatory role of our land tenure variables: the land tenure system, extent of land rights, and perceived security (measured by fear of eviction). However, several of our control variables are also important, and have a statistically significant relationship with resilience strategies across several of our models. The most consistent of these is gender, with female respondents being far *less likely* to note their interest or engagement in the resilience strategies that we measure. Another notable variable is livelihood source, and pastoralism in particular. We discuss these further below.

A third relevant variable is whether respondents perceive that the weather has become significantly worse over the past decade: These respondents are more likely to have taken household-level measures

to mitigate against climate change, and to say they are likely to join a climate-related protest. It makes sense that individuals who are highly aware of climate change are more likely to take action. Similar effects are found for education level, with higher levels of education tending to predict more "pro-social" resilient strategies.

In particular, higher levels of education are associated with an increased likelihood of both making household-level adaptations and engaging in collective restorations efforts. Importantly, however, as education rises, the preference for relying only on one's household decreases, suggesting that people with higher levels of education may be more socially embedded in their communities, and more attuned to the importance of collective organizing around climate resilience efforts. In addition, people with higher levels of education also tend to be more politically engaged, and are especially more likely to have engaged in past protests or have organized with others to raise an issue. We focus our discussion below on gender and pastoralism, given that the role of education and human capital are relatively well documented in the literature on climate efficacy and adaptive capacity (Angrist et al., 2023; Feinstein 2020).

Table 9. Additional relevant predictors of resilience strategies

Outcome 1

	Household adaptation	Collective adaptation	Household preferred
Gender: female	-	-	ns
Pastoralism	+	+	ns
Weather worse	+	ns	-
Education level	+	ns	-

Outcome 2

	Joined protest	Raised issue	Climate protest
Gender: female	-	-	-
Pastoralism	-	+	ns
Weather worse	ns	ns	+
Education level	+	+	ns

Outcome 3

	Supports violence
Gender: female	ns
Pastoralism	ns
Weather worse	ns
Education level	ns

[+] = Positive and statistically significant relationship.
[-] = Negative and statistically significant relationship
[ns] = No statistically significant relationship.

5.4.1 Gender

In the growing literature linking land tenure with climate change mitigation or adaptation, many of these focus on the tenure rights of women. The importance of women's land rights for climate adaptation builds on longer-standing agenda to close the large and enduring gender gap in land rights between women and men; an effort based on the recognition that the gender gap in land rights has profound implications for the social, economic, and political power of women in a given society (Meinzen-Dick et al. 2019). As a report by an international land rights organization summarizes, connecting girls and women to land helps "reduce their vulnerabilities, increase their status in their families, and aid in bringing about a change in the way their communities perceive them" (Landesa 2013: 2).

There are two key arguments linking women's land rights with climate adaptation. The first is that women are disproportionately vulnerable to climate-related disasters compared to men – partly because they do not have the same rights over land as men (Kituo Cha Sheria 2023; Feyertag et al., 2021; Harari 2019), and also because they are more likely to reliant on agriculture compared to men (Levien 2017). The second is that where women can inherit and control land, they are in a better position to adopt climate-smart agricultural innovations and sustainable resource management (Gumucio, 2024).

Beyond agricultural spaces, studies suggests that strengthening women's land rights also expands the resilience-enhancing responses that are available, for example, by increasing a woman's ability to diversify her income source, invest in new infrastructure, or migrate to a less environmentally precarious region ("Land Rights Can Break the Gender Bias in Climate Action for the Good of the Planet" 2022). An additional assumption, albeit with less empirical evidence, is that women are better stewards of the land compared to men.

Our survey data aligns with several of these observations. Notably, women in our sample have weaker land rights, and are also less likely

to engage in several of the resilience strategies we tested. Table 10 compares the land rights and ownership rates of women compared to men. The gender gap indicates the difference in scores between female and male respondents. Among respondents indicating that their household had a title deed, we show the proportion of respondents whose name appears on this title deed, which provides a relatively clear metric of a woman's formal land tenure rights. Importantly, we do not assume that a woman whose name appears on a title deed will be able to exercise her rights, but that her power to do so is generally stronger compared to women who have no documented land rights in their name.

Table 10. Gender gap in land rights

	Women (%)	Men (%)	Gender gap
LRI score	19	31	-12
Title deed	26	35	-9
Name on title deed	32	55	-23
Fear of eviction	28	22	+6

While these figures point to a notable gender disparity, this gap is smaller than the gender gap nationally.

Legally, there are a number of laws and constitutional provisions protecting women's right to own land in Kenya. Yet women are routinely denied rights to land and continue to represent only a small proportion of landowners (i.e., title deed holders).[31] In 2009, FIDA-Kenya estimated that only 1 percent of all title deeds were held by women alone, and around 5-6 percent were held jointly with men, despite women heading 32 percent of all households. A 2018 audit

[31] These rights were formalized and institutionalized in Kenya's 2010 constitution. Previously, the constitution prohibited discrimination on the basis of sex, but did not intervene in customary or personal law (FIDA Kenya), and hence offered few meaningful legal or institutional safeguards to protect women's rights to land.

conducted by Kenya Land Alliance's indicated that 10 percent of all titles issued by the government between 2013-2017 went to women – a sign of some progress – yet the actual proportion of all land titled to women continues to lag: only 1.6 percent of the 10 million hectares registered between 2013-2017 went to women.

The KLA study also revealed significant variation in women's land ownership at the county level. In Laikipia, for example, women actually received a greater proportion of all titles issued compared to men (55 vs. 42 percent). In Mombasa, only 34 percent of all title deeds issued went to women (versus 64 percent that were issued to men), but the figure is still much higher than country-wide average of 10 percent.[32] More worrying is a recent study by the Kenya Institute for Public Policy Research and Analysis (KIPPRA), which found that the number of women with access to agricultural land declined by 14 percent between 2013 and 2022.[33]

As Table 9 indicates, our regression analysis shows that women are less likely to have made household-level adaptive changes, less likely to have engaged in collective restoration efforts, less likely to have joined a protest, less likely to see themselves participating in climate-related protest in the future, and less likely have worked with others to raise an issue. These results are certainly discouraging, as they portray women as more passive in the face of climate-related threats.

This finding stands in contrast to the many reports and studies portraying women, including poor and rural women, and indigenous women, on the front-line of climate adaptation and resilience. Indeed, we do not think women in our sample are ambivalent or agentless in the face of climate-related threats. Rather, we suspect that their social power – which is partly a function, and a reflection of their weaker land rights compared to men – shapes the set of

[32] Our focus on title deeds does not suggest that title deed ownership is the only or even primary metric of women's tenure security. It is, however, among the most available and systematic metrics of ownership.

[33] In 2014, 61.3 percent of women aged 15-49 did not own any land. This number rose to 75.0 percent for agricultural land.

actions or responses that feel feasible, thinkable, and appropriate. In this regard, it may be that women are responding and organizing in the face of climate threats in ways not captured by our survey questions (and our focus groups provide some support for this explanation).

For instance, while research shows that women are in general less likely to protest then men, women may rely on other forms of political claim-making (Cruz and Tolentino 2019). Engagement and protest activity, moreover, could also be a function of other unobserved factors, like the fact that there is gender gap in cell phone ownership, which creates a political information disadvantage that may limit forms of engagement (Barnes et al. 2025). Nonetheless, our results provide compelling suggestive evidence that women's active engagement in climate adaptation and resilience is linked critically to their land tenure rights.

5.4.2 Livelihood source: pastoralism

In addition to gender, another important correlate of climate adaptation and resilience is a household's main economic activity (i.e. livelihood source). In our survey, we measure economic activity using a self-reported question, re-coded into four categories: (1) pastoralism and agropastoralism, (2) farming, (3) entrepreneur/wage labor, and (4) other. In the regression analyses that we present, we create two binary variables, one indicating whether the household relies primarily on pastoralism and one indicating whether they rely primarily on farming. We focus on these two categories (in which the reference category is all other livelihood sources) in order to have a clear way of measuring each of the livelihood sources relative to all others.

As Table 9 above shows, reliance on pastoralism has an especially strong association with several or the climate strategies we measure. Notably, pastoralists are more likely to engage in household-level adaptation strategies compared to other households, are more likely

to have participated in community restoration efforts, and equally, are more likely to have gotten together with others to raise an issue. Yet while pastoralism may be bound up with a set of local social institutions that facilitates certain forms of collective action, pastoralist households are also far less likely to have participated in protests compared to other types of households.

Our data also provides a closer view of the land tenure arrangements shaping the lives of pastoralists. Specifically, among the 158 respondents who indicate that their household relies on pastoralism or agropastoralism, 51 percent have title deeds to their land (n = 80), 31 percent report living on communal land,[34] and 19 percent fear eviction (mean level across sample is 25 percent). Meanwhile, the average land rights score among pastoralists is .36, with notable differences between men (.43) and women (.30). Despite this notable gender gap, the mean LRI score among pastoralists is 11 points higher than the sample mean (.25).

Taken together, our findings here suggest that holding land tenure variables constant, along with other socio-economic variables, people engaged in pastoralism are especially pro-active when it comes to engaging in climate adaptation strategies. This makes sense given that the ability of pastoralist households to survive and thrive hinges on their ability to provide food and water for their livestock. They are also more likely to live in regions of the country where access to state services, such as piped water, are scarce. They are thus especially vulnerable to climate-related threats.

[34] Meanwhile, 61 percent of pastoralists (n=94) report living on private land. It's possible that some respondents are indeed living on community/communal land, but are not aware.

6 Unpacking land tenure and resilience strategies: Insights from focus groups

The survey findings presented in the previous section highlight clear associations between land tenure conditions and the climate resilience strategies that individuals pursue. However, these statistical patterns do not fully capture the lived experiences, motivations, and constraints shaping people's adaptation decisions. This chapter presents qualitative insights from our focus group discussions (FGDs) conducted in selected areas of Laikipia and Mombasa, as a way to provide a more complete picture of the ways that land tenure and security interact with local livelihoods and urban-rural contexts to affect strategies of climate resilience: the interest or ability to engage in household-level or collective adaptive measures, to mobilize politically, and at the most extreme, the willingness to see violence a viable or even necessary means of strengthening one's household or community's resilience to climate-related threats.

6.1 Patterns of land tenure and security across focus group settings

We begin by briefly outlining the land tenure systems and perceived security that characterize each of the five communities where we held focus groups. The Table below summarizes these features, also listing the primary livelihoods engaged in by our FGD respondents in each area. Our interviews highlight how these different modes of land access have implications for tenure (in)security – discussed in this section – as well as for adaptation strategies, discussed in the subsequent sections.

Table 11. Summary of focus group discussions

LAIKIPIA

County	Primary livelihoods	Land tenure system	Perceived security
Il Polei/Munishoi	Pastoralism	Customary (Group ranch)	Strong
Segera	Mixed: farming, trading, and livestock raising	Public (informal rental market)	Tenuous
Mukogodo	Farming	Private	Strong

MOMBASA

County	Primary livelihoods	Land tenure system	Perceived security
Changamwe	Trading & small business	Public (informal rental market)	Extremely tenuous
Mwembe Legeza	Fishing, trading, farming	Private & Public (informal rental market)	Extremely tenuous

Laikipia County contains several land tenure systems, reflecting in part, the diverse land usage across the county – from large-scale ranches and wildlife conservancies to government-owned settlement schemes supporting smallholder farmers. Our first focus group site, Il Polei, is a group ranch where members of the community hold land collectively. In this case, communal tenure also comes with a set of local institutions that strengthen tenure security. Respondents describe communal land rights that are clearly marked and well governed. For instance, respondents explain that if you are a member of the community, you are able to construct your house within the area designated for dwellings, and outsiders can be granted access after an application to the Community Land Management Committee.

Our second site, Segera, is a peri-urban settlement. Most people here rent their homes and land parcels from private landlords – even

while the government, is in many cases, the actual landowner. In this regard, Segerea parallels the landlord-tenant dynamics in the informal settlements of larger cities such as Nairobi, where landlords acquire informal ownership rights, and then lease out these informally owned properties.[35] In instances where people express tenure insecurity, it is typically related to one's inability to pay rent. Landlords, respondents explain, do not hesitate to evict errant tenants. They emphasized further that their ability to pay rent was a function of their crop yield, a yield that felt more uncertain with increasingly erratic weather patterns.

In Mukogodo, a forest preserve in Laikipia North, focus group participants describe a private land tenure system in which each household holds rights to land individually, and where households tend to have title deeds to such land. When asked about whether residents feared losing their land in the future, respondents described bringing in surveyors or village elders to help with any dispute or potential land loss – a response that indicates their trust in local institutions to enforce their tenure rights.

Our focus groups in Mombasa provide a contrast to those in Laikipia. Whereas Laikipia residents feel generally land secure across different tenure settings, FGD participants in Mombasa express more uniform feelings of tenure insecurity, results that parallel our survey results. We selected two focus group sites in Mombasa. The first, Changamwe, is an urban settlement where residents are squatting on government land. One FGD respondent captures this everyday insecurity: "People are evicted anytime here without regarding human rights. Your house can be flattened today and tomorrow then another person constructs just after."[36] In the second site, Mwembe Legeza, residents reside on land owned by the government or absentee landlords. Further, while most residents

[35] For instance, in the informal settlement of Kibera, the state officially owns the land, but there is nonetheless and lively and entrenched informal rental market (see Elfversson and Höglund, 2018).

[36] FGD, Changamwe, R1.

lack formal documentation to their land, many residents claim that the land on which they reside has been in their family for generations.[37]

In both areas, respondents highlight two key issues that heighten their tenure insecurity: (1) overlapping claims to the land, in which two or more people or families claim ownership to the same parcel, and (2) anti-outsider claim-making in which so-called natives use their proclaimed indigeneity to elevate their land claims above so-called "immigrants" – generally people or ethnic communities associated with other parts of Kenya.[38] As one respondent explains, "If we protest, they tell us we are immigrants from the countryside and have no land rights in the coast. This is a recipe for conflict and violence."[39]

People also worry about the prospects of largescale upgrading programmes and the government's "affordable housing" schemes. Respondents point to examples where residents have been evicted without proper compensation and denied the promise to move back to the new housing. In these instances, holding a title deed does little to assuage fear of eviction. As one respondent explains,

"My greatest fear is that there is a rumour that the financial bill 2024 seeks to convert our land ownership to lease, and we will be required to pay monthly rent to the government. If we fail, we lose the land. We fear the nullification of our titles."[40]

These concerns underline the political dynamics of tenure security, which hinge partly on group belonging and socio-economic status, but also government policy aiming to upgrade, formalize (often selectively), or in some cases, clear informal settlements.

---

[37] In the survey, Changamwe ward has the lowest proportion of title deeds, and second-to-lowest LRI scores compared to all other wards in the sample.

[38] This dynamic typically plays out between Mijikenda sub-tribes, who see the coast as their ancestral land, and people whose ethnic identities are associated with "upcountry" regions of Kenya (e.g., the Kikuyu, Luhya, and Luo).

[39] FGD, Changamwe, R1.

[40] FGD, Mwembe Legeza, R9.

Another important and related theme to emerge from our focus groups is the role of trust in local authorities and social institutions as an important correlate of tenure security. In our Laikipia focus groups – regardless of whether people were living on communal, private, or government land – respondents expressed a general confidence in local authorities' willingness and ability to address land issues or conflicts where they arose. Respondents talked about turning to the local chief or the police for assistance, taking matters to the courts, or bringing in a surveyor to resolve conflicting land claims. In the communal settlement, elders and other community leaders also played a key role in resolving any issues and ensuring the communal rules are followed. By contrast, respondents in our Mombasa FGDs expressed little to no confidence in local authorities:

"Our land issues are too complex to be handled by chiefs. Even when we report to them, they send us to the land department. Sometimes even going to the county government just worsens the issues."[41]

Similarly, another Mombasa respondent remarked:

"There are many conflicts among residents. These conflicts are fueled by land officers. There are double allocations, diversion of ownership to new people and sale of occupied land to newcomers. (…) There is conflict between residents and the local administrators who fail to protect residents from land fraudsters."[42]

These county-level differences in trust in local institutions and authorities is evident in our survey as well. One of our questions asked "If someone else was trying to remove you from your land or take away your land, how confident are you that local authorities or local leaders would protect your rights?" While 70 percent of respondents in Laikipia answered they were confident or highly confident, only 44 percent of respondents in Mombasa did the same. Again, these dynamics underline the importance of social trust and cohesion in understanding tenure security, which in turn affects

[41] FGD, Changamwe, R1.

[42] FGD, Mwembe Legeza, R6.

adaptive strategies and collective action. Taken together, our findings point to the importance of legitimate and trusted local social institutions in facilitating tenure security – even or especially – where tenure is held collectively or accessed informally.

6.2 Land tenure and climate adaptation strategies

In the survey, we found that individuals with stronger land rights are more likely to invest in both household- and community-level adaptation strategies, while those experiencing tenure insecurity are less likely to do so. The focus groups reinforce this finding by demonstrating how land tenure shapes perceptions of risk, long-term planning, and incentives for cooperation. Our survey findings also indicated that women experience greater tenure insecurity than men, which in turn limits their ability to engage in climate adaptation strategies. The qualitative findings reinforce this, showing that women in both rural and urban areas face barriers to land ownership, but also how women navigate these challenges.

In **Il Polei and Munishoi**, where land tenure is communal, there are several different mechanisms of communal adaptation. These strategies spanned from preventive measures (measures seeking to reduce drought and floods) such as grass and tree planting and constructing water reserves and drainage, to more adaptive strategies such as paddocking (preventing grazing on certain grasslands in order to conserve these for times of drought) and reducing herd size. Communal resource governance plays a key role, as a respondent explains:

"there is the community land management committee, and there are also those called the grazing committee, who are responsible for matters of conservation."[43]

[43] FGD, Il Polei 1, R18.

Grazing committees help regulate pasture use, ensuring sustainability even during droughts. Critically, these grazing committees also have enforcement authority, including the ability to sanction community members who do not comply with community rules and norms around land and resource use. A participant from Il Polei/Munishoi explains how these grazing committee leaders are

"chosen by the community to ensure that the community's rules are followed. So, if we decide today that grazing will be limited to a certain area, that's how it will be…. So, we have a management committee that ensures things are done properly."[44]

In addition to grazing committees, pastoralist communities also employ paddocking to manage grazing pressure and preserve key areas for use in times of scarcity. One respondent explained how in response the dwindling grazing lands,

"*we use paddocking to find places where they can graze for about three months. Let's say we designate a specific area and close it off. We say that the grass in that area will be used during severe drought."*[45]

Another participant added,

"We also practice grass reseeding on bare lands and dig deep gullies to prevent soil erosion by building terraces and gabions, all as a community."[46]

These strategies illustrate how communal land tenure systems help structure collective resilience efforts, ensuring that natural resources are managed sustainably to withstand prolonged dry periods. Specifically, these systems, which are built into the communal land tenure system, facilitate cooperation and enable community members to plan for long-term sustainability.

By contrast, in the parts of Laikipia where private tenure was the norm, individual-level strategies were also mentioned more fre-

[44] FGD, Il Polei 1, R18.
[45] FGD, Il Polei 1, R2.
[46] FGD, Il Polei 1, R18.

quently. In areas like Segera and Mukogodo, there are not the same communal resource governance structures in place. Instead, because land tenure is private and more varied – consisting of both owning, renting and squatting – resource governance rules also seem less coherent.

This does not mean that people do not engage in climate adaptation, but that efforts to do so are more *ad hoc*, less well coordinated, and more often occur at the individual or household level. For instance, respondents in Mukogodo talked about switching livestock breeds:

"We try to keep cows that can adapt to this weather, like Ayrshire or Jersey. You know, they eat less, their stomachs are not as big as those of Fresian. And then we adopt goats."[47]

The respondent goes on to explain the benefits of goats, and their ability to keep producing milk, even during drought. Another farmer in Mukogodo talks about people starting kitchen gardens to ensure access to vegetables during the dry season, conserving water as a household, and diversifying livelihoods. A female farmer in Segera, meanwhile, points out that many people are beginning to diversify their incomes and resilience strategies:

"a farmer who was dealing with farming alone, now you find they are doing another business, they are also rearing livestock, or they do all three."[48]

Importantly, even without communal rules of resource governance, people – and women in particular – finds way to organize collectively. This becomes important not least given the gendered differences in land security, as demonstrated in our survey. Women in Mukogodo and Segera noted that land ownership is typically transferred through male relatives, leaving them reliant on male family members for access. In urban areas, particularly in Changamwe, women face additional barriers due to informal land tenure systems. However, despite these constraints, women's groups have emerged

[47] FGD, Mukogodo, R5.
[48] FGD, Segera, R6.

as important actors in household adaptation. Several respondents in both urban and rural FGDs described forming collective savings groups to invest in climate-resilient infrastructure, such as water storage tanks and improved irrigation systems. The same respondent in Segera, for instance, explains how

"during the rainy season, at least especially women have organized themselves into groups and they buy water tanks, so during the dry season, they have water."[49]

Yet these attempts at collective resilience are often limited by a lack of financial resources. Respondents emphasize that even when women organize themselves into groups, the money they pool together is often insufficient to purchase essential items, such as water tanks.[50]

Meanwhile, in both focus group sites in Mombasa County, widespread and deeply felt tenure insecurity affects respondent views about climate adaptation. Participants described how their lack of tenure limited the types of resilience strategies that they saw as feasible:

"Here we have no rights. We can't even dig a trench because we have no legal ownership documents."[51]

Residents tend to view state-led efforts to formalize land, moreover, as a way to grab land from locals and traditional land ownership norms. For one respondent, the commodification of land alongside growing inequality has eroded community norms:

"Ujamaa (communal living) has disappeared. We would share our happy moments and difficult moments and help each other as a community. Nowadays you can sleep on an empty stomach while your rich neighbor throws away leftovers."[52]

[49] FGD, Segera, R6.
[50] FGD, Segera, R1.
[51] FGD, Changamwe, R1.
[52] FGD, Changamwe, R8.

There are, of course, many reasons why people may view a decline in collective ethos – partly linked to changes in land use and tenure, but also linked to other social processes. What's key, however, is that both our survey data and focus group interviews from Mombasa reflect a sense of powerlessness in the face of climate change, or an inclination to turn inward – to rely only one oneself. This inclination is captured by a respondent from Changamwe, who emphasized that with respect to climate change adaptation;

"Personal responsibility is the way to go. Once we understand that we need to conserve and to clear our environment for our own good, everything will be okay."[53]

However, while agreeing on this, another respondent stressed that this did not free authorities from responsibility: "We still feel however, that the government and the local NGOs working on environmental issues need to educate the public on environmental conservation especially waste management. They should also use Nyumba Kumi [community policing] ambassadors to implement this."[54]

6.3 Land tenure and political engagement

Recall that in our survey data, we found that several land tenure variables were relevant in relation to political engagement (which we measured based on protest participation and getting together with others to raise an issue). On the one hand, having strong land rights or living on communal land predicted higher political engagement. This, we've suggested, can likely be explained by strong sense of self-efficacy among the land secure, and the higher collective action capacity among those living in communal land. However, we also found that people who are tenure insecure – who fear eviction – are more likely to protest or raise an issue. We attribute this to strong sense of grievance among the tenure insecure.

[53] FGD, Changamwe, R3.

[54] FGD, Changamwe, R2.

Our focus groups help expand on this set of findings. On the one hand, the role of politics – and urban grievances, specifically – was discussed more explicitly in the Mombasa FGDs than our rural FGDs. In both Changamwe and Mwembe Legeza, focus group participants described feelings of frustration over what they perceived as unfair land allocations and forced evictions. Several respondents explicitly connected their vulnerability to climate change to bad governance, and saw protest and other political engagement (such as petitioning responsible ministers) as important avenues to effect change. As expressed by one of the respondents in Changamwe,

"We start with public education, then we engage the government authorities, then if they fail to implement agreements we protest or go to court."[55]

However, most FGD respondents in Changamwe and Mwembe Legeza described reluctance to engage in political activism, particularly around land rights. Respondents noted that previous protests had been met with intimidation or threats of eviction, reinforcing their perception that engaging politically carried significant risks. One respondent from Changamwe explains,

"If we protest, they tell us we are immigrants from the countryside and have no land rights in the coast. This is a recipe for conflict and violence."[56]

Discussions also underscore the low regard that residents have of their local officials – views that can make political engagement seem futile. The lack of trust that residents have in officials stems primarily from their tenure insecurity and feeling like local administrators are unwilling or unable to "protect residents from land fraudsters."[57]

In the rural FGDs, support for strategies of political voice was weaker, and respondents expressed low support for protests as a way to push for climate change mitigation. In Segera, respondents expressed that political protest should be only a plan B, with

[55] FGD, Changamwe, R5.
[56] FGD, Changamwe, R1.
[57] FGD, Mwembe Legeza, R6.

household-level measures – such as tree planting or adapting farming practices – taking precedence. There were also evident gendered dynamics in these discussions: In particular, in the FGD with female small-scale farmers, participants explicitly rejected contentious political action, saying that

"When we suffer, we just stay quiet (…) we are peaceful people, we just wait for God to send the rain."[58]

Lower support for contentious political action such as protests among women also resonates with our statistical findings, as noted above.

At the same time, the FGDs in Laikipia underline how collective efficacy in a context of strong, communal land tenure can strengthen capacity for collective political action. Notably, in Il Polei, where tenure is communal and governed by local committees, respondents described instances where they petitioned local authorities to protect grazing land from external encroachment. While protests are rare, participants noted instances when, as a community, they protested both about elephant encroachment and banditry to the District Commissioner.[59] In turn, the discussions in Il Polei indicate that when these strategies are perceived as successful, it increases willingness to see them as effective for other issues as well, including possible future climate-related protests.[60] Similar experiences were raised by some of our respondents in Mwembe Legeza, who described a previous experience of successful protest action related to environmental issues. This experience, for them, underlined the relevance of this form of collective action:

"We have successfully used protests before to address climate issues. For a long time, the residents here were affected by the dust from the cement factory. We complained but no one took us seriously. (…) Eventually we got tired and organised a major protest. There are people who leaked the information to the

[58] FGD, Mukogodo, R3 and unanimous agreement.
[59] FGD, Il Polei 1, R14.
[60] FGD, Il Polei 2, R2.

Bamburi OCS (police officer commanding station) who declared the protest unlawful. We didn't call it off. We just changed the routes and time. In the protest we not only raised awareness with our placards and chants, but we also sent a message to the investor and government. They have since contained the dust and we enjoy a cleaner environment."[61]

Taken together, our focus groups point to how land-related grievances can motivate political action including protest, but also how marginalization and land insecurity can discourage collective action. In contrast, previous experience of effective political voice can embolden both urban and rural communities to raise their issues through petitions and protests, underlining the importance of collective efficacy for these forms of resilience strategies.

6.4 Land tenure and support for coercive strategies

Finally, our focus groups provide additional insights into how local communities understand the relationship between climate change, inter-group conflict, and violence. In the survey, we found a correlation between tenure insecurity and support for violence as a means of securing land rights. The qualitative findings expand on this. While it is important to note that respondents across our different FGDs stressed that violent incidents should be, and often are, taken to the police or other relevant local authorities, the discussions also revealed how tenure insecurity can fuel conflict in certain contexts, especially where climate stressors intensify competition for land, particularly among pastoralist groups in Laikipia.

In Il Polei and Segera, respondents in the focus groups emphasize how climate change is a source and driver of conflicts – describing how fights over increasingly scarce water and pasture led to crime:

[61] FGD, Mwembe Legeza, R9.

"People suffer from hunger, so someone might come all the way from Kokodo West or Dolon, come here and break into a shop outside, carrying food. You see how that comes from hunger (…) due to hunger... yes we resort to … fighting, arrows, guns."[62]

Notably, many pastoralist respondents described how drought-induced land scarcity had led to clashes between pastoralists and landowners, and that land-related tensions escalated during pro-longed dry seasons, as herders moved their livestock into privately held conservancies in search of pasture:

"There are no issues regarding land [right now], but you see the issues related to land, there are conflicts [in times of drought], because livestock come and take over. That's the conflict we've had."[63]

These accounts are similar to pastoralist related conflict in many parts of Kenya, such as in Tana River, where droughts frequently lead pastoralists to migrate closer to riverine areas and where cattle encroachment on sedentary farmers' lands have at times escalated into intense violent conflicts, exacerbated by competition for local political influence (Elfversson 2019; Malik 2018).

While none of our respondents expressed support for offensive violence (such as taking land from others) as a legitimate strategy, responses acknowledge of the potential need for self-defence in the face of climate-induced conflicts. While these dynamics were mentioned in both Mombasa and Laikipia, they were (perhaps unsurprisingly) most present in the conservancy area in Laikipia North, where banditry related to cattle-raiding and grazing conflicts is a regularly occurring security challenge (Bond 2014). Although it was seen as a last resort, the need to possibly take up arms for self-defence was recognized, as expressed by one respondent:

"The issue of climate change, it has brought conflicts. The first conflict is banditry, and it has also brought about the conflict of human-wildlife interaction. Livestock

[62] FGD, Il Polei 2, R1.
[63] FGD, Il Polei 2, R7.

come from far to look for water and grass here (…) so climate change has brought conflicts. We are trying to protect ourselves in various ways."[64]

Another respondent in the same focus group, talking about issues like encroachment on reserved grazing land and cattle theft, stressed:

"Yes, we have the right to protect ourselves, in any way, whether through force or whatever, we must protect ourselves."[65]

In urban areas, tenure insecurity fosters different forms of conflict. In Changamwe and Mwembe Legeza, residents described instances where land disputes between tenants and landlords escalated into physical confrontations. The combination of climate vulnerability and weak tenure protections exacerbates these tensions, increasing the potential for conflict over land access. For instance, as mentioned above, respondents in Changamwe indicated that conflicting land claims and the practice of questioning individuals' rights on the basis of autochthony was a source of conflict and violence.[66] Conflicts also arose from cases where land allocation by government authorities was conducted in ways that were perceived as unfair or untransparent. One respondent in Mwembe Legeza sums up these conflict dynamics relating to insecure tenure:

"There are many conflicts among residents. These conflicts are fuelled by land officers. There are double allocations, diversion of ownership to new people and sale of occupied land to newcomers. Such people encounter charged residents and sometimes are lucky to escape alive. There are also land agents who sell land fraudulently to unsuspecting buyers then leave them fighting for ownership with the people already occupying the land. There is conflict between residents and the local administrators who fail to protect residents from land fraudsters."[67]

Respondents in Changamwe in particular referred to frequent conflicts between landlords and tenants, underlining how tenure

[64] FGD, Il Polei 1, R18.
[65] FGD, Il Polei 1, R3.
[66] FGD, Changamwe, R1.
[67] FGD, Mwembe Legeza, R6.

insecurity leaves residents highly vulnerable and contributes to conflict and violence:

"Another annoying thing is that while we pay landlords, they do not remit the same to government. Most of them have huge debts. Sadly, when the government is recovering debts, they are nowhere to be found. It is us who have to bear their wrath and actions."[68]

Another respondent echoes this issue, and adds:

"Secondly, the same landlords and their caretakers keep leasing the same pieces of land to more people, but the amount we are expected to pay does not change. I still pay ksh7000 despite having someone who has encroached on my allocated plot. This will also create conflict between early settlers and latecomers."[69]

[68] FGD, Changamwe, R8.
[69] FGD, Changamwe, R1.

Concluding discussion

In this report, we have examined how land tenure shapes the ways that ordinary people adapt and respond to climate-related threats. Our study is situated in Kenya, a country highly affected by climate change, and draws on a household-level survey and focus group interviews in two counties, Laikipia and Mombasa. We focus on the role of land tenure – in its various dimensions – because land tenure powerfully shapes economic well-being, identity, and social and political power. Importantly, there is a growing recognition that tenure security is foundational to effective climate adaptation, but there is still limited evidence, especially at the micro-level, about how different dimensions of land tenure affect climate adaptation and resilience.

In this regard, this report makes two broad interventions. First, we move beyond binary treatments of land tenure and focus instead on three important dimensions: the tenure system, extent of land rights, and perceived security. Each of these dimensions has distinct implications for understanding the forms of climate adaption and resilience strategies among ordinary people. Second, this report expands concepts of climate resilience strategies to include, not just household or farm-level adaptation, but a broader range of social or political strategies that people might pursue, be they cooperative or contentious.

This report highlights the centrality of land tenure in shaping agency, collective action capacity, and grievance, each of which have important implications for understanding the prospects, forms, and limits of climate resilience among Kenyan households. Below, we briefly summarize each of our main findings and what they tell us about the broader relationship between land tenure and household-level climate resilience strategies.

(1) The land tenure system

Our first broad finding is that the land tenure system in which a person resides has important implications for the types of resilience strategies that they support or pursue (or choose not to pursue). In our analysis, a person's land tenure could take one of three forms: private land, government (i.e. public) land, and communal (i.e. community) lands. As we note in our analysis, our measure of these distinctions in our survey is imperfect. Importantly, it relies on a respondent knowing the type of land on which they reside, but these distinctions are often ambiguous. For example, a person's land might first be categorized as public land, but later becomes private when they have cleared all fees on the land and obtain a title deed. Nonetheless, the strong statistical associations, coupled with our qualitative evidence, enable us to confidently note a few important take-aways:

- People living on **private land** are less likely to engage in collectively-oriented resilience strategies, instead preferring mitigation measures at the household-level.
- The opposite is true for people living on **public/government land**. In these tenure environments, people are more likely to organize and work collectively.
- Living on **communal land**, meanwhile, does not predict household-level or collective adaptive strategies, but is associated with a propensity to engage or support more contentious forms of resilience, including participation in climate protests, and even support for violent redistribution of land and resources.

These findings point to the way that land tenure systems shape – and are shaped by – local social and political institutions: the formal and informal networks, norms, and organizations that shape interactions within communities, and between community members and authority (Lust 2022). If we think about land tenure systems as local institutional orders, then we can start to think about how norms and attitudes about cooperation (vs. individualism) or contention (vs.

complacency) might vary across these different spaces. For instance, in their study of Malawi and Zambia, (Harris and Honig 2023) find that people have stronger expectations of cooperation from people with customary property rights compared to people with land titles – an outcome they attribute the high dependence on collective social institutions in customary land settings (compared to statutory settings). Our focus groups provide some evidence along the same lines.

In terms of the choice between household-level or collectivist strategies, we find that private land seems to incentivize private solutions. Public land, which encompasses a range of residential arrangements, from urban squatters in Mombasa to people living on government settlement schemes, facilitates more publicly oriented strategies. Communal land, which is closely tied to ethnic group membership, also shapes more collective strategizing.

(2) Extent of land rights

Our second and most consistent finding is that strong land rights are important predictors of both household-level and collective climate resilience strategies. In our survey data, the association is especially strong when we measure the extent of a person's land rights using the land right index (LRI score), which captures a person's bundle of rights. As a person's LRI score increases, they are more likely to make climate-related adaptations to their home, more likely to participate in collective restoration efforts, more likely to prefer working with community members – rather than one's household only – when preparing for climate threats, more likely to mobilize politically to voice climate-related concerns. Our second measure of lands rights – owning a title deed – is a narrower measure of tenure rights, but is still revealing. Respondents whose household holds a title deed to their land are more likely to have made climate-friendly adaptations to their home and more likely to have participated in collective restoration efforts. We also find some evidence that people

whose households have title deeds are *less likely* to agree with statements endorsing the violent re-distribution of land.

These findings align with many other studies and reports indicating that tenure security is an important factor in enabling households – especially poor and rural households – to become more resilient to climate change effects. There are many possible explanations for the strong association between tenure rights and climate adaptation. We have referred to many of these throughout this report. We reiterate a few important explanations. The first explanation is that having or acquiring strong land rights is not random; it often reflects a person (or household's) status and power in their community, the strength of their networks, and their wealth. The most important non-random factor is gender, with men being far more likely to have strong land rights compared to women. Yet while having a title deed is endogenous to several variables, it also produces or enables power, status, and wealth accumulation. Hence, people with stronger land rights are more likely to pro-actively respond to climate change in large part, because they have the power, agency, and sense of efficacy to do so.

The second explanation, and the one emphasized by economists, is that because the pay-off for investing in climate-resilience strategies tends to be long-term, people will only make such investments where they are confident that their rights to a particular parcel will endure long into the future. This logic may indeed be part of the story. But there may be a simpler explanation as well, which relates to power and control: people who do not have rights over their land, by definition, have very little power over how the land (or dwelling) is used. Hence, even if they might want to, for example, change the type of fertilizer being used, or install solar panels, they may have very little power to implement such changes. This is especially true of people who rent their home or land. In our focus groups, a lack of (economic) incentives for adaptation was never raised as an issue; instead, participants emphasized different structural and political obstacles that made adaptation more difficult.

A key takeaway is that indeed, strengthening land rights are a key component of increasing adaptive capacity. However, the process of strengthening rights can also threatens status quo power relationships; a process that can be highly contentious, and disruptive, and can in some cases, end up amplifying unequal power relations (e.g. Boone 2019).

(3) Perceived tenure security

Our final measure is perceived tenure security, which we measure as a person's fear of being evicted. While fear of eviction is partly a function of their formal land rights, it need not be. As we discuss in the report, someone may have relatively weak rights (e.g., they rent from a family member) but may not worry about actually being evicted. Likewise, we can imagine someone who has a title deed but nonetheless fears imminent eviction, perhaps because they are ethnic outsiders, support a different political party, are estranged from other community members, or because the land has multiple claimants.

Indeed, our findings underline that eviction fear is not simply the inverse of strong land rights. Interestingly, while eviction fear does not predict household or collective-level adaptation, nor protest participation, it is positively associated with organizing with others to raise an issue, participating in a climate-related protest, and agreeing with statements that promote coercive redistribution (i.e. violence). We suggest that a key mechanism underlying these behaviours and attitudes is grievance, and discussions in our focus groups provide some support for this interpretation. People who fear being evicted tend to be highly attuned to out-group threat, or see themselves as victims of injustice, or at the losing end of patronage politics (Klaus 2020).

In these instances, grievance can act as a powerful motivator for people to engage in or promote actions that they view as mitigating their risk or building resilience to climate threats. In particular, fear

of eviction raises the salience of threat, which can put people on the defensive, while making them more attuned to social group differentiation and out-group threat (Hall and Werner 2022). These contexts of land insecurity can help explain why certain people or communities living under constant threat of eviction – be it from a rival group, the government, or a wealthy landlord – may view the violent re-claiming of land or territory from another group as appropriate, thinkable, and even necessary. This dynamic is especially visible in parts of Laikipia, where pastoralist communities at times use violence to promote and defend their grazing rights, rights that have been curtailed by large European-owned ranches and conservancies (Letai 2021). Along these lines, participants in our focus groups in Laikipia pointed to the need to possibly take up arms for self-defense, in a context where banditry related to cattle-raiding and grazing conflicts is a regularly occurring security challenge (Bond 2014).

In sum, our report highlights the different ways through which land tenure can shape the way that people respond to climate-related threats. By breaking down land tenure into three different components –- the tenure system, the extent of rights, and perceived security – our evidence points to three main pathways through which the land tenure can affect strategies of climate resilience: by shaping perceptions of agency and power, by facilitating norms of collective action, and by activating grievance. Future research should continue to explore how different aspects of land tenure interact, the institutional and political dynamics that shape land security and agency across different contexts, and additional factors that mediate the relationship between land tenure and climate resilience strategies.

Key takeaways for policymakers

Taken together, our study highlights the different ways through which land tenure can shape the way that people respond to climate-related threats. We point to three key mechanisms that may help

explain our findings. In particular, we suggest that variation in the rules and norms shaping how people access and secure rights to land have implications for climate resilience in so far as they: (a) shape perceptions of power and agency, (b) affect collective action capacity, and (c) activate grievances.

a) Agency and power: First, when people have secure and enforceable land rights, they tend to feel a greater sense of control over their future. This confidence reduces uncertainty and encourages long-term investments in climate adaptation. In contrast, people with weak or insecure land tenure often hesitate to make such investments, fearing displacement or the loss of their land. Moreover, people who lack tenure security may also lack the social or economic power to make such investments, even when they have an interest in doing so.

b) Collective action capacity: The way land is owned and governed shapes how people organize to improve their climate resilience. In the Kenyan context, we found that shared governance structures reinforce cooperative adaptation efforts in both communal and public land settings, while private land tenure is more often associated with individual decision-making. These different governance norms influence whether climate resilience strategies are pursued collectively or individually.

c) Grievance activation: Perceived tenure insecurity can fuel resentment, particularly when people feel excluded from land access or at risk of losing their property. In some cases, these grievances drive political mobilization or resource-based disputes, particularly in contexts where land is already contested.

Each of these mechanisms has powerful implications for understanding how different groups navigate climate risks, access resources, and engage with both state and non-state actors in their adaptation efforts. These mechanisms not only influence individual and community-level responses to climate threats but also shape broader socio-political dynamics, including conflict, cooperation,

and institutional trust. Based on our findings, we identify a set of key considerations for policymakers as they consider how to support local communities in their efforts to become more climate resilient.

1. Consider both formal and perceived land tenure security in climate adaptation policies

Policymakers should consider both formal and perceived aspects of land tenure when designing interventions. As this report shows, formal tenure security does not always translate into perceived security. Policies that focus only on formal land titles risk overlooking key social and political dynamics that may undermine tenure security. Recognizing that the source of land rights may be either formal or informal institutions, our findings stress that households and communities are in the best position to engage in cooperative and long-term adaptive strategies when they benefit from both strong tenure rights (e.g. title deed or written document from the government in the case of Kenya) and trust that their rights will be recognized and protected into the future (perceived tenure security).

2. Integrate land tenure dynamics into climate resilience strategies

Policymakers should recognize that land tenure affects climate resilience not only through access to resources but also by shaping perceptions of agency, collective action capacity, and grievance. Understanding these mechanisms is critical to designing effective climate adaptation policies that align with local governance structures, address social tensions, and strengthen institutional trust. For example, policies that strengthen land security can increase confidence in long-term investments in adaptation, and strategies that focus on reinforcing cooperative land management structures may encourage collective resilience efforts. Likewise, recognizing land-related grievances and addressing tenure insecurity in ad-

aptation planning can help prevent disputes that may escalate into conflict. By incorporating these dynamics into climate adaptation strategies, policymakers can enhance resilience in ways that are both sustainable and socially inclusive.

3. Address gender disparities in land tenure to strengthen women's climate adaptation

Women's land rights remain weak in Kenya and many other countries, limiting their ability to adapt to climate change and invest in long-term resilience strategies. While strengthening women's tenure security is critical, our findings also point to broader structural barriers – such as financial exclusion and limited decision-making power – that constrain women's agency in climate adaptation. This underlines the importance of an intersectional approach to land security. Addressing these challenges is not only necessary for enhancing climate resilience but also for advancing gender equality, a priority for aid agencies and national governments.

4. Strengthen land rights to enhance climate resilience, while recognizing political realities

The report's findings align with research showing that secure land rights are critical for strengthening climate adaptation, particularly for vulnerable households in marginalized regions. However, land formalization is not merely a technical or administrative endeavor; it is a deeply political process that can disrupt existing power relations. While formalization and private titling can increase land security for some, they are not the only ways to enhance land rights and tenure security. Policymakers should recognize a range of approaches, including strengthening communal tenure and improving enforcement of existing land rights, to ensure that land governance reforms do not reinforce existing inequalities.

References

Angrist, N., Winseck, K., H.A. Patrinos, & J. Graff Zivin, 2023. Human capital and climate change (Policy Research Working Paper No. 10316). The World Bank.

Aksakal, M., and K. Schmidt, 2015. Migration and Social Protection as Adaptation in Response to Climate-Related Stressors: The Case of Zacatecas in Mexico. In Environmental Change, Adaptation and Migration: Bringing in the Region, 80–97. Springer.

Albertus, M. 2025. Land power: Who has it, who doesn't, and how that determines the fate of societies. Basic Books.

Albertus, M., 2021. Property without rights: Origins and consequences of the property rights gap. Cambridge University Press.

Albertus, M., and K. Klaus, 2025. Land and Politics. Annual Review of Political Science, 28.

Alhola, S., & A Gwaindepi, 2024. Land tenure formalisation and perceived tenure security: Two decades of the land administration project in Ghana. Land Use Policy, 143, 107195.

Bahta, S., Wanyoike, F., Kirui, L., Mensah, C., Enahoro, D., Karugia, J., & Baltenweck, I. 2023. Livestock sector transformation in Kenya: Current state and projections for the future (Chapter 3). In B. Makau, J. Nzuma, & J. Kihara (Eds.), Kenya food system: A compendium of situation analyses, trends, and outlooks (pp. 51–76). International Livestock Research Institute (ILRI).

Balaton-Chrimes, S. Ethnicity, democracy and citizenship in Africa: Political marginalisation of Kenya's Nubians. Routledge, 2016.Barnes, T., E. Rains, J. Thomas, and J. Wu., 2025. The Gender Digital Divide and Gender Gaps in Protest Participation. Unpublished manuscript.

Belay, A., Recha, J.W., Woldeamanuel, T. and Morton, J.F., 2017. Smallholder farmers' adaptation to climate change and determinants of their adaptation decisions in the Central Rift Valley of Ethiopia. Agriculture & Food Security, 6(1): 1-13.

Besley, T., 1995. Property rights and investment incentives: theory and evidence from Ghana. J. Political Econ. 103(5):903–937.

Bond, J., 2014 Conflict, development and security at the agro–pastoral–wildlife nexus: a case of Laikipia County, Kenya. Journal of development studies, 50(7): 991-1008.

Boone, C., 2015. Land Tenure Regimes and State Structure in Rural Africa: Implications for Forms of Resistance to Large-Scale Land Acquisitions by Outsiders. Journal of Contemporary African Studies 33 (2): 171–90.

Boone, C., 2014. Property and political order in Africa: Land rights and the structure of politics. Cambridge University Press.

Boone, C., 2011. Politically allocated land rights and the geography of electoral violence: The case of Kenya in the 1990s. Comparative Political Studies, 44(10), 1311-1342.

Boone, C., A. Dyzenhaus, A. Manji, C. W. Gateri, S. Ouma, J. K. Owino, A. Gargule, and J. M. Klopp, 2019. Land Law Reform in Kenya: Devolution, Veto Players, and the Limits of an Institutional Fix. African Affairs 118 (471): 215–37.

Branch, D. (2011). Kenya: Between hope and despair, 1963-2011. Yale University Press

Buhaug, H. 2015. Climate–conflict research: some reflections on the way forward. Wiley Interdisciplinary Reviews: Climate Change, 6(3), 269-275.

Castro, B., and C. Kuntz, 2022. Land Tenure Insecurity and Climate Adaptation: Socio-Environmental Realities in Colombia and Implications for Integrated Environmental Rights and Participatory Policy. In Land Tenure Security and Sustainable Development, 177–99. Palgrave Macmillan, Cham.

Cities Alliance. 2021. Building Climate Resilience and Sustainable Cities for All. Chakrabarti, S. 2020. The Land Tenure Security Advantage: A catalytic asset for sustainable and inclusive rural transformation. IFAD Advantage Series. Rome: IFAD.

Chimhowu, Admos, and Phil Woodhouse. 2006. Customary vs Private Property Rights? Dynamics and Trajectories of Vernacular Land Markets in Sub-Saharan Africa. Journal of Agrarian Change 6 (3): 346–71.

Connolly-Boutin, L. and Smit, B., 2016. Climate change, food security, and livelihoods in sub-Saharan Africa. Regional Environmental Change, 16(2), 385-399.

Cruz, C., and C. Tolentino, 2019. Gender, Social Recognition, and Political Influence. Unpublished working paper, available at https://economics.ubc.ca/wp-content/uploads/sites/38/2019/11/cruz_tolentino_gender_influence.pdf

Dachaga, W. and W. T. de Vries, 2021. Land Tenure Security and Health Nexus: A Conceptual Framework for Navigating the Connections between Land Tenure Security and Health. Land 10 (3): 257.

De Soto, H., 2000. The mystery of capital: Why capitalism triumphs in the West and fails everywhere else. Basic Books.

Dimitrov, Radoslav S. 2016. The Paris Agreement on Climate Change: Behind Closed Doors. Global Environmental Politics 16 (3): 1–11.

Dorward, N. and S. Fox, 2022. Population Pressure, Political Institutions, and Protests: A MultilevelAnalysis of Protest Events in African Cities. Political Geography 99 (November): 102762.

Doshi, Sapana. 2013. The Politics of the Evicted: Redevelopment, Subjectivity, and Difference in Mumbai's Slum Frontier. Antipode 45 (4): 844–65.

Dube, T., Moyo, P., Ncube, M. and Nyathi, D., 2016. The impact of climate change on agro-ecological based livelihoods in Africa: A review. Journal of Sustainable Development, 9(1), 256-267.

Dyzenhaus, A., 2021. Patronage or Policy? The Politics of Property Rights Formalization in Kenya. World Development 146 (October): 105580.

Effiong, C. J., J. M. Wakawa Zanna, D. Hannah, and F. Sugden, 2024. Exploring Loss and Damage from Climate Change and Global Perspectives That Influence Response Mechanism in Vulnerable Communities. Sustainable Environment 10 (1): 2299549.

Eisinger, P, 1973. "The Conditions of Protest Behavior in American Cities." American Political Science Review 67 (March):11-28.

Elfversson, E., 2019. The political conditions for local peacemaking: A comparative study of communal conflict resolution in Kenya. Comparative Political Studies, 52(13-14): 2061-2096.

Elfversson, E., and K. Höglund, 2018. Home of last resort: Urban land conflict and the Nubians in Kibera, Kenya. Urban Studies, 55(8), 1749–1765.

EUJRC, 2024. Global Drought Threatens Food Supplies and Energy Production. European Union Joint Research Centre [2 October 2024].

FAO, 2015a. Climate change and food security: risks and responses. Rome: Food and Agriculture Organization of the United Nations.

FAO, 2015b. Safeguarding Land Tenure Rights in the Context of Agricultural Investment. Rome: Food and Agriculture Organization of the United Nations.

FAO, 2002. Land Tenure and Rural Development. FAO Land Tenure Studies 3. Rome: Food and Agriculture Organization of the United Nations.

Federation of Women Lawyers Kenya (FIDA-Kenya). (2009). Women's land and property rights in Kenya: A training handbook. Retrieved from https://land.igad.int/index.php/documents-1/countries/kenya/gender-3/625-women-s-land-and-property-rights-in-kenya/file

Feinstein, N. W., & K.J Mach, 2020. Three roles for education in climate change adaptation. Climate policy, 20(3), 317-322.

Feyertag, J., 2022. Land Rights Can Break the Gender Bias in Climate Action for the Good of the Planet. ODI: Think Change, March 8, 2022. https://odi.org/en/insights/land-rights-can-break-the-gender-bias-in-climate-action-for-the-good-of-the-planet/

Feyertag, J., Childress, M., Langdown, I., Locke, A., & Nizalov, D, 2021. How does gender affect the perceived security of land and property rights? Evidence from 33 countries. Land Use Policy, 104, 105299.

Field, E., 2005. Property rights and investment in urban slums. Journal of the European Economic Association 3.2(3): 279-290.

Fjelde, H., & Von Uexkull, N., 2012. Climate triggers: Rainfall anomalies, vulnerability and communal conflict in Sub-Saharan Africa. Political Geography, 31(7), 444-453.

Fox, G. R., 2018. Maasai group ranches, minority land owners, and the political landscape of Laikipia County, Kenya. Journal of Eastern African Studies, 12(3), 473–493.

Goldstein, M. and Udry, C., 2008. The profits of power: Land rights and agricultural investment in Ghana. Journal of political Economy, 116(6): 981-1022.

Government of Kenya. (2004). Report of the Commission of Inquiry into the Illegal/Irregular Allocation of Public Land (Ndung'u Report). Nairobi, Kenya: Government Printer.

Gravesen, M. L., 2021. The contested lands of Laikipia: Histories of claims and conflict in a Kenyan landscape. Brill.

Gumucio, T., 2024. Women's Land Tenure Security as a Pathway to Climate Change Mitigation and Adaptation. Seattle: Landesa.

Hall, J., & K Werner, 2022. Trauma and Trust: How War Exposure Shapes Social and Institutional Trust Among Refugees. Frontiers in Psychology, 13, 786838.

Harari, M. F., 2019. Women's inheritance rights and bargaining power: Evidence from Kenya. Economic Development and Cultural Change, 68(1), 189–238.

Harris, A. S., & L. Honig, 2023. Mutual Dependence and Expectations of Cooperation. The Journal of Politics, 85(1), 192-208.

Hassan, M. and K. Klaus, 2023. Closing The Gap: The Politics of Property Rights in Kenya. World Politics 75 (2): 233–79.

Heinrich Böll Stiftung & Route to Food Initiative. 2025. Soil atlas 2025: Facts and figures about soils, land, and agroecology – Kenyan edition. Heinrich Böll Stiftung. https://ke.boell.org/sites/default/files/2025-02/soilatlas-2025_-ke-edition-web.pdf

Hillesund, S., & G. Østby, 2023. Horizontal inequalities, political violence, and nonviolent conflict mobilization: A review of the literature. Journal of Economic Surveys, 37(5), 1589-1635.

Holland, A. 2016. Forbearance, American Political Science Review, 110(2): 232-246.

Homer-Dixon, T. F. (1999). Environment, scarcity, and violence. Princeton University Press.

Huber, J., and U. Murray, 2024. Turning Climate Justice into Practice? Channeling Loss and Damage Funding through National Social

Protection Systems in Climate‐vulnerable Countries. Wiley Interdisciplinary Reviews: Climate Change 15 (2): e867.

ILC, 2024. Land rights as a pathway out of the climate and biodiversity crises: How our members are contributing to change. Rome: International Land Coalition.

IPCC, 2023. Summary for Policymakers. In Climate Change 2023: Synthesis Report. Geneva, Switzerland: Intergovernmental Panel for Climate Change (IPCC).

IPCC, 2020. Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Geneva: Intergovernmental Panel on Climate Change.

IPCC, 2007. Climate Change 2007 Synthesis Report. Geneva, Switzerland: Intergovernmental Panel for Climate Change (IPCC).

Letai, J., 2021. The contested lands of Laikipia: Histories of claims and conflict in a Kenyan landscape. In J. Lind, D. Okenwa, & I. Scoones (Eds.), Land, investment & politics: Reconfiguring East Africa's pastoral drylands (pp. 25–46). James Currey.

Kabubo-Mariara, J., & R. Mulwa, 2019. Adaptation to climate change and climate variability and its implications for household food security in Kenya. Food security, 11, 1289-1304.

Kameri-Mbote, P., 2016. Kenya Land Governance Assessment Report. World Bank. Retrieved from https://documents1.worldbank.org/curated/ar/829991504864783043/pdf/119619-WP-P095390-PUBLIC-7-9-2017-10-9-20-KenyaFinalReport.pdf

Kanyinga, K. 2009. Land distribution in Kenya (Chap 3), in Agricultural Land Distribution, World Bank.

Kanyinga, K., 2000. Re-Distribution from above: The Politics of Land Rights and Squatting in Coastal Kenya. Uppsala: Nordic Africa Institute.

Kapstein, E. 2017. Seeds of Stability. Cambridge: Cambridge University Press.

Kenney-Lazar, Miles. 2018. Governing Dispossession: Relational Land Grabbing in Laos. Annals of the American Association of Geographers 108 (3): 679–94.

Kenny, L., et al., 2022. Gender Norms and Family Planning amongst Pastoralists in Kenya: A Qualitative Study in Wajir and Mandera. Sexual and Reproductive Health Matters 30 (1): 2135736.

Kenya Institute for Public Policy Research and Analysis (KIPPRA). 2023. Promoting land ownership among women in Kenya. KIPPRA. Retrieved from https://kippra.or.ke/promoting-land-ownership-among-women-in-kenya/

Kituo Cha Sheria. (2023). Women's land rights: Understanding and securing land rights for women in Kenya. Kituo Cha Sheria. https://kituochasheria.or.ke/wp-content/uploads/2023/11/Women-Land-Rights-Booklet-FINAL3-1.pdf

KLA, 2024. Historic Land Injustice in Laikipia County, Kenya. Available at https://kenyalandalliance.or.ke/index.php/welcome/blogpost/28 (retrieved 2024-11-25).

KLA, 2018. Kenya Land Issuance: Disaggregated data analysis. Nakuru: Kenya Land Alliance.

Klaus, K, 2020. Political Violence in Kenya: Land, Elections, and Claim-Making. Cambridge: Cambridge University Press.

KNBS, 2016. Basic Report: 2015/2016

Kenya Integrated Household Budget Survey (KIHBS). Nairobi: Kenya National Bureau of Statistics.

Kogo, B. K., L. Kumar & R. Koech, 2021. Climate change and variability in Kenya: a review of impacts on agriculture and food security. Environment, Development and Sustainability, 23(1), 23-43.

KRC, 2024. Floods Impact and Interventions, 2024. Kenya Red Cross. Available at https://www.redcross.or.ke/floods (retrieved 2024-11-25).

Landesa, 2013. Security for girls through land: Pilot evaluation (2012-2013). Seattle: Landesa.

Lawry, S., C. Samii, R. Hall, A. Leopold, D. Hornby, and F. Mtero, 2017. The Impact of Land Property Rights Interventions on Investment and

Agricultural Productivity in Developing Countries: A Systematic Review. Journal of Development Effectiveness 9 (1): 61–81.

Levien, M, 2017. Gender and land dispossession: A comparative analysis (Discussion Paper No. 15). UN Women.

Leviten-Reid, C., and R. A. Matthew, 2018. Housing Tenure and Neighbourhood Social Capital. Housing, Theory and Society 35 (3): 300–328.

Landesa. (2013). Baseline study: Security for girls through land project. Landesa. https://cdn.landesa.org/wp-content/uploads/Landesa-Girls-Poject-Baseline-Study.pdf

Letai, J., & J. Lind, 2013. Squeezed from all sides: changing resource tenure and pastoralist innovation on the Laikipia Plateau, Kenya. In Pastoralism and Development in Africa (pp. 164-176). Routledge.

Linke, A. M., O'Loughlin, J. McCabe, J. T., & Tir, J. 2015. Rainfall variability and violence in rural Kenya: Investigating the effects of drought and the role of local institutions with survey data. Global Environmental Change, 34, 35–47.

Lund, C., 2024. Coding Regimes of Possession. An Essay on Land, Property, and Law. Globalizations, 1– 16.

Lund, C., 2022. Public Authority, Property, and Citizenship: What We Talk about When We Talk about Land. In The Oxford Handbook of Land Politics, edited by S. M. Borras Jr. and J. C. Franco, Oxford University Press.

Lund, C. and C. Boone, 2013. Introduction: Land Politics in Africa–Constituting Authority over Territory, Property and Persons. Africa 83 (1): 1–13.

Lust, E. M., 2022. Everyday choices: The role of competing authorities and social institutions in politics and development. Cambridge University Press.

Malik, A. 2018. Constitutional reform and new patterns of electoral violence: Evidence from Kenya's 2013 elections. Commonwealth & Comparative Politics, 56(3), 340–359.

Manji, A. 2020. The struggle for land and justice in Kenya (Vol. 49). Boydell & Brewer.

Mamdani, M., 2018. Citizen and Subject. Princeton University Press.

McCandless, E. and G. Simpson, 2015. Assessing Resilience for Peacebuilding – Executive Summary. Interpeace.

McEvoy, D. and Mitchell, D., 2019. Climate resilient land governance in the global south. The Routledge Companion to Environmental Planning, pp.225-237.

McNamee, L., 2018. Mass Resettlement and Political Violence: Evidence From Rwanda. World Politics 70(4): 595–644.

Manji, A. 2012, The grabbed state: Lawyers, politics and public land in Kenya. Journal of Modern African Studies, 50(3): 467-492.

Meinzen-Dick, R., A. Quisumbing, C. Doss, and S. Theis, 2019. Women's Land Rights as a Pathway to Poverty Reduction: Framework and Review of Available Evidence. Agricultural Systems, Agricultural research for rural prosperity: Rethinking the pathways, 172 (June):72–82.

Mitchell, D.P., 2014. The importance of land use control & documenting property rights in Disaster Risk Reduction in Pacific Island countries. J. Spatial Sci. 59 (1), 107–119.

Mukherjee, M., and S. Fransen, 2024. Exploring Migration Decision-Making and Agricultural Adaptation in the Context of Climate Change: A Systematic Review. World Development 179 (July): 106600.

Murken, L. and Gornott, C., 2022. The importance of different land tenure systems for farmers' response to climate change: A systematic review. Climate Risk Management, p.100419.

MoALF. 2017. Climate Risk Profile for Laikipia County. Kenya County Climate Risk Profile Series. The Ministry of Agriculture, Livestock and Fisheries (MoALF), Nairobi, Kenya

.Ndiritu, S. W., 2021. Drought responses and adaptation strategies to climate change by pastoralists in the semi-arid area, Laikipia County, Kenya. Mitigation and adaptation strategies for Global Change 26: 1–18.

Nelson, F. and A. Agrawal, 2008. Patronage or Participation? Community-Based Natural Resource Management Reform in Sub-Saharan Africa. Development and Change 39 (4): 557–85.

Ngome, C. S., & C. Yeom, 2024. Impacts of Floods on Sustainable Urban Development in Kenya: The Case of Nairobi and Mombasa. Asia-pacific Journal of Convergent Research Interchange (APJCRI) 10 (10): 147–160.

Obeng-Odoom, F., 2022. Global Migration beyond Limits: Ecology, Economics, and Political Economy. Oxford University Press.

Obeng-Odoom, F., 2011. Developing Accra for All? The Story behind Africa's Largest Millennium City. Development 54 (3): 384–92.

OCHA, 2024. Kenya: Heavy Rains and Flooding Update - Flash Update #6 (17 May 2024). United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Available at https://reliefweb.int/report/kenya/kenya-heavy-rains-and-flooding-update-flash-update-6-17-may-2024 (accesssed 2025-03-18).

Omoegun, A. O., P. MacKie, and A. Brown, 2019. The Aftermath of Eviction in the Nigerian Informal Economy. International Development Planning Review 41 (1): 107–28.

Onoma, A. K., 2009. The politics of property rights institutions in Africa. Cambridge University Press.

Paller, J.W., 2019. Building permanence: fire outbreaks and emergent tenure security in urban Ghana. Africa, 89(3),437-456.

Petrova, K., 2021. Natural hazards, internal migration and protests in Bangladesh. Journal of Peace Research, 58(1), 33-49.

Ramírez, D. (2024, September). Amazon fires devastate Indigenous territories and protected areas: A crisis in numbers. Amazon Frontlines. https://amazonfrontlines.org/chronicles/amazon-fires-devastate-indigenous-territories-and-protected-areas-a-crisis-in-numbers/

Reale, A. and Handmer, J., 2011. Land tenure, disasters and vulnerability. Disasters, 35(1), pp.160-182.

Rights and Resources Initiative (RRI)., 2021. Summary of RRI analyses: Kenya's Community Land Act and the need to strengthen women's land rights. Rights and Resources Initiative. https://rightsandresources.org/wp-content/uploads/Summary-of-RRI-Analyses_Kenya_EN.pdf

Schlager, E., & Ostrom, E. 1992. Property-rights regimes and natural resources: a conceptual analysis. Land economics, 249-262.

Sharifi, A., Simangan, D., Lee, C. Y., Reyes, R., Katramiz, T., Josol, J. C. C., Dos Muchangos, L., Virji, H., Kaneko, S., Tandog, T. K., Tandog, L., & Islam, M. 2021. Climate-induced stressors to peace: A review of recent literature. Environmental Research Letters, 16(5), 053001.

Shannon, M., K. Otsuki, A. Zoomers, and M. Kaag, 2018. Sustainable Urbanization on Occupied Land? The Politics of Infrastructure Development and Resettlement in Beira City, Mozambique. Sustainability 10 (9): 3123.

Stewart, D. W., and P. N. Shamdasani, 2014. Focus Groups: Theory and Practice. Sage.

Teklewold, H., Mekonnen, A. and Kohlin, G., 2019. Climate change adaptation: a study of multiple climate-smart practices in the Nile Basin of Ethiopia. Clim. Develop. 11(2), 180–192

Tarrow, Sidney. 1996. "Social Movements in Contentious Politics: A Review Article." American Political Science Review, 90(4): 874-883.

Theisen, O. M., 2012. Climate clashes? Weather variability, land pressure, and organized violence in Kenya, 1989–2004. Journal of Peace Research, 49(1), 81–96.

Toulmin, C., 2020. Land, Investment, and Migration: Thirty-Five Years of Village Life in Mali. Oxford, New York: Oxford University Press.

Tseng, T.-W. J., et al. 2021. Influence of land tenure interventions on human well-being and environmental outcomes. Nature Sustainability 4(3): 242-251.

Tye, S., and I. Suarez, 2021. Locally Led Climate Adaptation: What Is Needed to Accelerate Action and Support? World Resources Institute. https://doi.org/10.46830/wriwp.20.00039. UN-Habitat. 2019. Land Tenure and Climate Vulnerability, Report 03/209.

von Uexkull, N., Buhaug H., 2021. Security implications of climate change: A decade of scientific progress. Journal of Peace Research, 58(1), 3-17.

Weinstein, L., 2021. Evictions: Reconceptualizing Housing Insecurity from the Global South. City & Community 20 (1): 13–23.

Wily, L A., 2017. Customary Tenure: Remaking Property for the 21st Century. In Comparative Property Law, 458–78. Edward Elgar Publishing.

Young, L. A., and K. Sing'Oei, 2011. Land, Livelihoods and Identities: Inter-Community Conflicts in East Africa. London: Minority Rights Group International.

Annex 1: Overview of the data and summary statistics

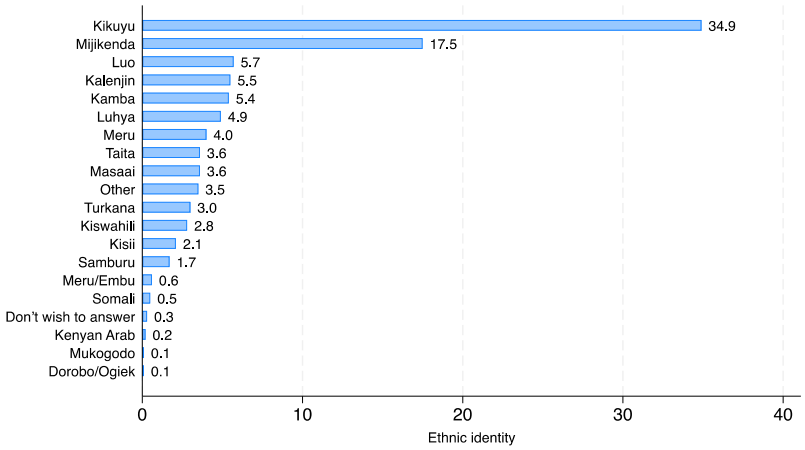
We used stratified random sampling in order to attain a survey sample that was, to the extent possible, representative of the county population. We did this by selecting the total number of target households based on population size of the subcounty, hence sampling more households in subcounties with larger populations. We sampled from all subcounties in Laikipia and Mombasa counties respectively. Within each subcounty, we randomly selected polling stations, which served as the lowest enumeration unit and starting point for the enumeration team. The use of polling stations as proxies for enumeration areas is relatively common practice for face-to-face survey research when the boundaries of local enumeration areas are not well mapped or easily available. Polling stations are relatively reliable proxies because they are typically created based on population density and local settlements. In Kenya in particular, the list of polling stations is regularly maintained by the Independent Electoral and Boundary Commission (IEBC), and because they tend to be schools, sites of worship, or public gathering spaces, are relatively easy to locate in otherwise unmapped or poorly mapped areas. We were then able to locate the ward, division, and village within which each polling station was located.

Table 1:1. Sampling strategy

	Mombasa	Laikipia
Sampled subcounties	5	6
Sampled wards	28	15
Sampled polling stations	62	63
Villages	213	222
Sample total (respondents)	496	504

Our survey instrument consisted of 104 questions that helped measure our variables of interest, along with questions that measure relevant controls and other relevant confounders. We designed the questionnaire to produce observational data, using both attitudinal and behavioural questions. The average age of respondent is 39 years. In terms of livelihood sources, pastoralists make up 16 percent of the sample, farmers 25 percent, people engaged in small business 42 percent, and salaried workers (e.g., teachers) 14 percent. In terms of the ethnic composition, Kikuyu-identifying respondents make up 35% of our sample, the largest proportion of whom reside in Laikipia. Mijikenda-identifying respondents, who are the majority ethnic group in Mombasa County, make up the second-largest group in our sample (see below for a breakdown of ethnic groups in the sample).

Figure 1:1. Ethnic composition of survey sample (proportions)



Control variables and full survey questionnaire

In our analyses, we control for a number of factors that could affect both land tenure and climate resilience strategies. First, we control

for the degree of self-reported climate exposure, as discussed in section 4.1 of the report. Second, we capture individual-level characteristics that may shape the way people access land as well as how they respond to climate change. We control for a respondent's gender, coded as a binary variable; their education level, coded on a 5-grade scale; and age, measured in years. We also control for whether the respondent belongs to the local ethnic majority or not (Kikuyu in Laikipia, and Mijikenda in Mombasa). This is important since ethnic belonging in the Kenyan context has been shown to condition both land access and social and political capital (Balaton-Chrimes 2016; Boone 2014; Klaus 2020). Based on the same logic, we control for the household's economic resources in the form of a lived poverty index (based on a series of questions asking how often in the past month the household has had to resort to e.g. borrowing or harvesting immature crops to secure food), as well as an access index capturing how far they need to walk in order to access a set of key societal services.

Since our primary interest is in understanding the general association between land tenure and resilience strategies, we also control for aspects of local livelihood which could affect this relationship. First, we control for whether the respondent lives in a rural area, as compared to an urban or mixed area; this was coded by the survey enumerators, at enumeration area level. Second, we include two dummy variables that control for whether the household's main economic activity is pastoralism/agropastoralism or farming, other livelihoods being the reference category. Around 16% of our respondents are pastoralists, and 25% farmers. Full descriptive statistics are provided below. To access the full survey questionnaire, see **link here.**

Table 1:2. Descriptive statistics

Independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Communal land	931	.173	.378	0	1
Private land	930	.722	.448	0	1
Government land	931	.106	.308	0	1
Land right index (LRI)	1000	.251	.363	0	1
Title deed	1000	.307	.461	0	1
Eviction fear	997	.25	.433	0	1

Dependent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Household adaptation	1000	.519	.499	0	1
Collective adaptation	1000	.49	.5	0	1
Household only	995	.185	.388	0	1
Joined protest	993	.059	.237	0	1
Raised issue	997	.438	.496	0	1
Climate protest	987	.427	.495	0	1
Coercive redistribution	967	.23	.421	0	1

Control variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Climate exposed	1000	.713	.453	0	1
Worse weather	931	.904	.294	0	1
Gender: female	1000	.5	.5	0	1
Education level	997	3.216	1.261	1	5
Age	998	38.662	14.366	18	84
Ethnic majority	997	.526	.5	0	1
Lived poverty index (LPI)	1000	1.748	.61	1	4

Variable	Obs	Mean	Std. Dev.	Min	Max
Access index	1000	2.346	.732	1	4.571
Livelihood: Pastoral	998	.158	.365	0	1
Livelihood: Farming	998	.251	.434	0	1
Rural	1000	.485	.5	0	1

Note on Results tables

The results tables (online Annexes 4–10) correspond to our discussion of survey results in Chapter 5. Each model contains the full set of controls, which are specified in the descriptive statistics table in above. As noted, the models are estimated using mixed-level logistic regression. The "number of groups" refers to the level (unit) of random effects, i.e. the subcounty level. To improve model fit, the regressions presented in online Annex 7 instead include random effects at the polling station level.

Annex 2: Descriptive statistics – land tenure

Table 2:1. Mean responses to measures of land tenure

	Land tenure system			Land rights		Perceived Security
Sub-County	*% private land*	*% communal land*	*% gov't land*	*LRI (score)*	*% title deeds*	*% fear eviction*
LAIKIPIA						
Laikipia Central	87	08	5	40	69	31
Laikipia East	74	18	8	34	54	33
Laikipia North	6	94	0	9	3	22
Laikipia West	79	18	3	36	49	25
Nyahururu	85	10	6	30	49	21
MOMBASA						
Kisauni	88	10	3	19	22	24
Jomvu	68	17	15	21	13	36
Likoni	53	36	11	13	11	23
Nyali	66	12	22	22	5	31
Mvita	66	2	33	17	3	13
Changamwe	50	15	35	10	0	46
Total Means (%)	**72**	**17**	**11**	**25**	**31**	**25**

Table 2:2. Correlation analysis – land tenure variables

	Private land	Communal land	Govern-ment land	Land rights index	Title deed	Fear eviction
Private land	1.000					
Communal land	-0.7365***	1.000				
Govern-ment land	-0.5524***	-0.1577***	1.000			
Land rights index	0.1181***	-0.1168***	-0.0244	1.000		
Title deed	0.2452***	-0.1409***	-0.1795***	0.3504***	1.000	
Fear eviction	-0.1689***	-0.1076***	0-1177***	-0.1229***	-0.2131***	1.000

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Annex 3: Descriptive statistics – climate resilience strategies

Table 3:1. Overview of resilience strategies across county and sub-county

(%)	Outcome 1: *Household vs. collective strategies*			Outcome 2: *Political engagement*			Outcome 3*: Coercion*
Sub-County	*Household adaptation*	*House-hold only*	*Collective adaptation*	*Joined protest*	*Raised issue*	*Climate protest*	*Coercive redistribution*
LAIKIPIA							
Laikipia Central	70	24	57	4	52	39	15
Laikipia East	71	6	72	6	58	46	28
Laikipia North	41	9	72	6	56	52	32
Laikipia West	73	13	52	7	55	52	33
Nyahururu	66	22	45	8	45	40	21
MOMBASA							
Kisauni	33	40	28	3	26	32	27
Jomvu	45	2	60	10	61	64	37
Likoni	32	9	40	6	24	34	8
Nyali	34	34	49	5	35	44	15
Mvita	23	22	42	5	23	30	13
Changamwe	54	5	45	5	59	54	36
Total Means (%)	**52**	**18**	**49**	**6**	**44**	**43**	**23**

Previous EBA reports

2025:01 *What Are They Fighting For? An Issue-based Approach to the Analysis and Resolution of Civil War*, Johan Brosché, Sebastian Raattamaa, Kate Lonergan

2024:10 *Extreme Poverty and Marginalisation in Bangladesh: Drivers and Lessons for Development Cooperation*, Owasim Akram, Mathilde Maîtrot and Joe Devine.

2024:09 *En antologi om trender och olika perspektiv på global hälsa*, Jesper Sundewall och Malin Ahrne (red.)

2024:08 *Reformagendans genomförande: en startrapport*, Expertgruppen för biståndsanalys

2024:07 *Swedish Climate Mitigation Finance*, Númi Östlund, Luisa Weber, Max Schmidt, Igor Shishlov, Annika Hilgert, Fiona Lambe, Flintull Annica Eriksson, Per Strömberg

2024:06 *External Support to Constitution Building Processes*, Cheryl Saunders, Andy Carl, Anna Dziedzic, Samantha Smith

2024:05 *Evidence-Based Anti-Corruption? Evaluation of Sida's Efforts to Reduce Corruption in Partner Countries*, Marina Nistotskaya, Hayden Buker, Marcia Grimes, Anna Persson, Michelle D'Arcy, Bo Rothstein, Adea Gafuri

2024:04 *Det svenska biståndets transparens,* Pontus Hedin, Christopher Lokatt

2024:03 *Public Opinion on Carbon Pricing and Revenue Uses in East Africa,* Niklas Harring, Anna Nordén, Daniel Slunge

2024:02 *The Long and Winding Road: Evaluation of Swedish Long-Term Development Cooperation with Liberia*, Christoph Emminghaus, Simon Wallisch, Kou Meapeh Gbaintor-Johnson, Julian Klauke, Anouchka Baldin, Tillman Hönig, John Pokoo, Johanna Schaefer-Kehnert

2024:01 *Supporting Local Actors: Evaluation of Sweden's Application of the Grand Bargain Localisation Agenda*, Sophia Swithern, Charlotte Lattimer, Teddy Atim, Gang Karume, Dmytro Kondratenko, Kateryna Korenkova, Cheery Zahau

2023:04 *Det är resultatet som räknas: För en bättre resultatredovisning av biståndet*, Númi Östlund och Helena Hede Skagerlind

2023:03 T*he Swedish Aid Response to the HIV Epidemic: An Overview,* Pam Baatsen, Thyra de Jongh, Hannah Kabelka, Josefine Olsson, Liana Petrosova, Renée Robbers, Noor Tromp, Edited by The Expert Group for Aid Studies

2023:02 *More Than a Label, Less Than a Revolution: Sweden's Feminist Foreign Policy*, Ann Towns, Elin Bjarnegård, Katarzyna Jezierska

2023:01 *The Role of Aid in the Provision of Sexual and Reproductive Health Services*, Jesper Sundewall, Björn Ekman, Jessy Schmit

2022:08 *The Rise of Social Protection in the Global South: The Role of Foreign Aid,* Miguel Niño-Zarazúa, Ana Horigoshi, Alma Santillán Hernández, Ernesto Tiburcio

2022:07 *Member State Influence in the Negotiations on the Neighbourhood, Development and International Cooperation Instrument (NDICI*), Magnus Lundgren, Jonas Tallberg, Camilla Pedersen

2022:06 *Swedish Development Cooperation with Ethiopia: Sixty Years of Lessons Learned*, Bereket Kebede, Leif Danielsson, Hailu Elias, Gunnar Köhlin

2022:05 *Mapping Swedish Aid to Agriculture*, Ivar Virgin, Alice Castensson, Filippa Ek, Ylva Ran

2022:04 *A Team Player and Free Agent: Sweden's Engagement with EU Country and Joint Programming*, Erik Lundsgaarde2022:03 Hur förändra världen? En antologi om förändringsteorier i biståndet, Kim Forss och Númi Östlund (red.)

2022:02 *Swedish Aid in the Time of the Pandemic*, Carsten Schwensen, Jonas Lövkrona, Louise Scheibel Smed

2022:01 *Utvärdering av strategiska sekunderingar som del av svenskt påverkansarbete*, Lisa Dellmuth, Paul T. Levin, Nicklas Svensson

2022: July *Social protection for the forcibly displaced in low- and middle-income countries*, Jason Gagnon, Mona Ahmed, Lisa Hjelm, Jens Hesemann (joint with the OECD Development Centre, published as OECD Development Policy Papers No. 43)

2021:08 *Practicing Peacebuilding principles: A Study of Sweden's Engagement in Fragile and Conflict-Affected States*, Gary Milante, Jannie Lilja, Jups Kluyskens, Johanna Lindström

2021:07 *In Pursuit of Sustainable Peace: An Evaluation of the Folke Bernadotte Academy 2008–2019*, Nicklas Svensson, Julian Brett, Adam Moe Fejerskov, Charlotte Bonnet

2021:06 *Informerad eller kunnig: Utvärdering av insatser för information och kommunikation om bistånd 2010–2020*, Maria Grafström, Cecilia Strand

2021:05 *Supporting Elections Effectively: Principles and Practice of Electoral Assistance*, Therese Pearce Laanela, Sead Alihodžić, Antonio Spinelli, Peter Wolf

2021:04 *Sexual and Reproductive Health and Rights: Measuring Values and Norms to Guide Swedish Development Cooperation,* Anna Kågesten, Karin Båge, Jesper Sundewall, Helena Litorp, Bi Puranen, B., Olalekan Uthman, Anna Mia Ekström

2021:03 *Credible Explanations of Development Outcomes: Improving Quality and Rigour with Bayesian Theory-Based Evaluation*, Barbara Befani

2021:02 *Målbild och mekanism: Vad säger utvärderingar om svenska biståndsinsatsers måluppfyllelse?*, Markus Burman

2021:01 *Data Science Methods in Development Evaluation: Exploring the Potential*, Gustav Engström and Jonas Nóren

2020:07 *Effects of Swedish and International Democracy Aid*, Miguel Niño-Zarazúa, Rachel M. Gisselquist, Ana Horigoshi, Melissa Samarin and Kunal Sen

2020:06 *Sextortion: Corruption and Gender-Based Violence*, Åsa Eldén, Dolores Calvo, Elin Bjarnegård, Silje Lundgren and Sofia Jonsson

2020:05 *In Proper Organization we Trust – Trust in Interorganizational Aid relations*, Susanna Alexius and Janet Vähämäki

2020:04 *Institution Building in Practice: An Evaluation of Swedish Central Authorities' Reform Cooperation in the Western Balkans,* Richard Allen, Giorgio Ferrari, Krenar Loshi, Númi Östlund and Dejana Razić Ilić

2020:03 *Biståndets förvaltningskostnader För stora? Eller kanske för små?*, Daniel Tarschys

2020:02 *Evaluation of the Swedish Climate Change Initiative, 2009–2012,* Jane Burt, John Colvin, Mehjabeen Abidi Habib, Miriam Kugele, Mutizwa Mukute, Jessica Wilson

2020:01 *Mobilising Private Development Finance: Implications for Overall Aid Allocations*, Polly Meeks, Matthew Gouett and Samantha Attridge

2019:09 *Democracy in African Governance: Seeing and Doing it Differently*, Göran Hydén with assistance from Maria Buch Kristensen

2019:08 *Fishing Aid – Mapping and Synthesising Evidence in Support of SDG 14 Fisheries Targets*, Gonçalo Carneiro, Raphaëlle Bisiaux, Mary Frances Davidson, Tumi Tómasson with Jonas Bjärnstedt

2019:07 *Applying a Masculinities Lens to the Gendered Impacts of Social Safety Nets*, Meagan Dooley, Abby Fried, Ruti Levtov, Kate Doyle, Jeni Klugman and Gary Barker

2019:06 *Joint Nordic Organisational Assessment of the Nordic Development Fund (NDF),* Stephen Spratt, Eilís Lawlor, Kris Prasada Rao and Mira Berger

2019:05 *Impact of Civil Society Anti-Discrimination Initiatives: A Rapid Review,* Rachel Marcus, Dhruva Mathur and Andrew Shepherd

2019:04 *Building on a Foundation Stone: the Long-Term Impacts of a Local Infrastructure and Governance Program in Cambodia*, Ariel BenYishay, Brad Parks, Rachel Trichler, Christian Baehr, Daniel Aboagye and Punwath Prum

2019:03 *Supporting State Building for Democratisation? A Study of 20 years of Swedish Democracy Aid to Cambodia*, Henny Andersen, Karl Anders Larsson och Joakim Öjendal

2019:02 *Fit for Fragility? An Exploration of Risk Stakeholders and Systems Inside Sida*, Nilima Gulrajani and Linnea Mills

2019:01 *Skandaler, opinioner och anseende: Biståndet i ett medialiserat samhälle*, Maria Grafström och Karolina Windell

2019: August *Migration and Development: the Role for Development Aid,* Robert E.B. Lucas (joint with the Migration Studies Delegation, Delmi, published as Delmi Research overview 2019:5)

2018:10 *Nation Building in a Fractured Country: An Evaluation of Swedish Cooperation in Economic Development with Bosnia and Herzegovina 1995–2018*, Claes Lindahl, Julie Lindahl, Mikael Söderbäck and Tamara Ivankovic

2018:09 *Underfunded Appeals: Understanding the Consequences, Improving the System*, Sophia Swithern

2018:08 *Seeking Balanced Ownership in Changing Development Cooperation Relationships*, Nils Keizer, Stephan Klingebiel, Charlotte Örnemark, Fabian Scholtes

2018:07 *Putting Priority into Practice: Sida's Implementation of its Plan for Gender Integration*, Elin Bjarnegård, Fredrik Uggla

2018:06 *Swedish Aid in the Era of Shrinking Space – the Case of Turkey*, Åsa Eldén, Paul T. Levin

2018:05 *Who Makes the Decision on Swedish Aid Funding? An Overview,* Expertgruppen för Biståndsanalys

2018:04 *Budget Support, Poverty and Corruption: A Review of the Evidence*, Geske Dijkstra

2018:03 *How predictable is Swedish aid? A study of exchange rate volatility,* Númi Östlund

2018:02 *Building Bridges Between International Humanitarian and Development Responses to Forced Migration*, Alexander Kocks, Ruben Wedel, Hanne Roggemann, Helge Roxin (joint with the German Institute for Development Evaluation, DEval)

2018:01 *DFIs and Development Impact: an evaluation of Swedfund,* Stephen Spratt, Peter O'Flynn, Justin Flynn

2017:12 *Livslängd och livskraft: Vad säger utvärderingar om svenska biståndsinsatsers hållbarhet?* Expertgruppen för biståndsanalys

2017:11 *Sweden's Financing of UN Funds and Programmes: Analyzing the Past, Looking to the Future,* Stephen Browne, Nina Connelly, Thomas G. Weiss

2017:10 *Seven Steps to Evidence-Based Anticorruption: A Roadmap*, Alina Mungiu-Pippidi

2017:09 *Geospatial analysis of aid: A new approach to aid evaluation*, Ann Sofie Isaksson

2017:08 *Research capacity in the new global development agenda*, Måns Fellesson

2017:07 *Research Aid Revisited – a historically grounded analysis of future prospects and policy options*, David Nilsson, Sverker Sörlin

2017:06 *Confronting the Contradiction – An exploration into the dual purpose of accountability and learning in aid evaluation*, Hilde Reinertsen, Kristian Bjørkdahl, Desmond McNeill

2017:05 *Local peacebuilding – challenges and opportunities*, Joakim Öjendal, Hanna Leonardsson, Martin Lundqvist

2017:04 *Enprocentmålet – en kritisk essä*, Lars Anell

2017:03 *Animal health in development – it's role for poverty reduction and human welfare*, Jonathan Rushton, Arvid Uggla, Ulf Magnusson

2017:02 *Do Anti-Discrimination Measures Reduce Poverty Among Marginalised Social Groups?* Rachel Marcus, Anna Mdee, Ella Page

2017:01 *Making Waves: Implications of the irregular migration and refugee situation on Official Development Assistance spending and practices in Europe*, Anna Knoll, Andrew Sherriff

2016:11 *Revitalising the policy for global development*, Per Molander

2016:10 *Swedish Development Cooperation with Tanzania – Has It Helped the Poor?,* Mark McGillivray, David Carpenter, Oliver Morrissey, Julie Thaarup

2016:09 *Exploring Donorship – Internal Factors in Swedish Aid to Uganda*, Stein-Erik Kruse

2016:08, *Sustaining a development policy: results and responsibility for the Swedish policy for global development,* Måns Fellesson, Lisa Román

2016:07 *Towards an Alternative Development Management Paradigm?* Cathy Shutt

2016:06 *Vem beslutar om svenska biståndsmedel? En översikt,* Expertgruppen för biståndsanalys

2016:05 *Pathways to change: Evaluating development interventions with Qualitative Comparative Analysis (QCA),* Barbara Befani

2016:04 *Swedish responsibility and the United Nations Sustainable Development Goals*, Magdalena Bexell, Kristina Jönsson

2016:03 *Capturing complexity and context: evaluating aid to education*, Joel Samoff, Jane Leer, Michelle Reddy

2016:02 *Education in developing countries what policies and programmes affect learning and time in school?* Amy Damon, Paul Glewwe, Suzanne Wisniewski, Bixuan Sun

2016:01 *Support to regional cooperation and integration in Africa – what works and why?* Fredrik Söderbaum, Therese Brolin

2015:09 *In search of double dividends from climate change interventions evidence from forest conservation and household energy transitions*, G. Köhlin, S.K. Pattanayak, E. Sills, E. Mattsson, M. Ostwald, A. Salas, D. Ternald

2015:08 *Business and human rights in development cooperation – has Sweden incorporated the UN guiding principles?* Rasmus Klocker Larsen, Sandra Atler

2015:07 *Making development work: the quality of government approach,* Bo Rothstein and Marcus Tannenberg

2015:06 *Now open for business: joint development initiatives between the private and public sectors in development cooperation,* Sara Johansson de Silva, Ari Kokko and Hanna Norberg

2015:05 *Has Sweden injected realism into public financial management reforms in partner countries?* Matt Andrews

2015:04 *Youth, entrepreneurship and development*, Kjetil Bjorvatn

2015:03 *Concentration difficulties? An analysis of Swedish aid proliferation*, Rune Jansen Hagen

2015:02 *Utvärdering av svenskt bistånd – en kartläggning*, Expertgruppen för biståndsanalys

2015:01 *Rethinking Civil Society and Support for Democracy*, Richard Youngs

2014:05 *Svenskt statligt internationellt bistånd i Sverige: en översikt*, Expertgruppen för biståndsanalys

2014:04 *The African Development Bank: ready to face the challenges of a changing Africa?* Christopher Humphrey

2014:03 *International party assistance – what do we know about the effects?* Lars Svåsand

2014:02 *Sweden´s development assistance for health – policy options to support the global health 2035 goals*, Gavin Yamey, Helen Saxenian, Robert Hecht, Jesper Sundewall and Dean Jamison

2014:01 *Randomized controlled trials: strengths, weaknesses and policy relevance*, Anders Olofsgård

Land access determines what kind of adaptation to climate change that is possible, as well as the strategies people choose. Any support to climate adaptation needs to be based on a thorough understanding of what land rights people really have. All too often this is not the case, as this study shows.

Hur tillgång till mark bestäms avgör vilka åtgärder för klimatanpassning som är möjliga, och vilka strategier människor väljer. Varje insats för klimatanpassning måste utgå från en gedigen förståelse av berörda människors markrättigheter. Alltför ofta är det inte fallet, visar denna studie.

EBA
www.eba.se

Expertgruppen för biståndsanalys (EBA) är en statlig kommitté som oberoende analyserar och utvärderar svenskt internationellt bistånd.

The Expert Group for Aid Studies (EBA) is a government committee with a mandate to independently analyse and evaluate Swedish international development aid.