



# Pathways to sustainability: Climate resilience and productivity in Uganda – IGC Climate Change Conference 2024

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## Introduction

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In recent years, global transformations have reshaped the way people live, consume, and work, with technological advancements driving innovation and resilience. However, residents of middle- and low-income countries face the risk of being excluded from these benefits, remaining particularly vulnerable to economic, political, and environmental shocks. Research underscores the heightened susceptibility of these populations to extreme weather events and the adverse impacts of climate change, notably evident in countries like Uganda - where there is a heavy reliance on rain-fed agriculture, rapid population growth, limited adaptive capacity, and inadequate infrastructure; vulnerabilities that are compounded by challenges like deforestation and land degradation.

Recognising the increasing importance of addressing climate change for sustainable development and economic growth, the International Growth Centre (IGC) in collaboration with Uganda's Ministry of Water and Environment and Royal Holloway University of London organised a Climate Change Workshop on June 20th and 21st, 2024. This event brought together an array of international and local experts, researchers, and policymakers to discuss cutting-edge research and policy innovations for understanding the interplay between climate change and environmental damage, the pathway to achieving a net-zero economy, the role of natural resource management, and the implications for workers and firms in the context of Uganda and East Africa. This conference was envisioned as a catalyst for productive dialogue and knowledge sharing, fostering informed decision-making and cost-effective strategies across the region.

The following document provides a summary of it, outlining relevant takeaways and subsequent policy recommendations of each session and roundtable.

## Takeaways

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### **Labour markets: Challenges for firms and workers**

Climate change significantly impacts the operations and productivity of firms across various sectors in Uganda. Extreme weather events, shifting weather patterns, and environmental degradation disrupt infrastructure, supply chains, and overall business activities. For instance, floods and droughts can devastate crops, halt production, and lead to the loss of critical assets, particularly affecting the agricultural and manufacturing sectors. This is especially concerning in Uganda, often referred to as the 'Pearl of Africa,' where approximately 24% of its GDP is attributable to agriculture. The unpredictability

of climate conditions complicates planning and investment, making it challenging for businesses to maintain stable operations and growth.

As firms grapple with climate-related challenges, the workforce also experiences heightened economic vulnerabilities and inequalities, facing job insecurity, reduced income, and threats to their livelihoods. Addressing these issues requires innovative approaches that incorporate climate resilience into workforce management and economic policies. By enhancing adaptive capacities, promoting sustainable practices, and fostering collaboration between employers and employees, Uganda can build resilience to climate change. This approach not only mitigates negative impacts but also unlocks economic opportunities, fostering inclusive growth and ensuring that the benefits of development are widely shared.

To delve deeper into the relationship between climate change and labour markets, the session featured several insightful presentations. Jeremia Stalder, a PhD student at the University of St. Gallen, presented his research project titled "Cash over Work: Informal Redistribution among Employers and Workers in Kampala." Conducted between September 2022 and March 2023, this study examines the social function of employment in poor countries, focusing on redistribution. Stalder's research highlights the perception of employment as a form of redistribution in developing countries and explores the preferences of workers and employers between welfare programmes and workfare programmes. The findings reveal that, particularly in the context of increasing climate change-related redistribution requests, employment can play a critical role in supporting vulnerable populations. This field experiment, which includes data from SMEs in Kampala, provides valuable insights into how employment practices can be adapted to enhance resilience to climate challenges. For example, Green Bio Energy, a Ugandan social enterprise, has adapted its employment model to enhance resilience to climate change by producing and selling clean energy cookstoves and briquettes made from agricultural waste. By employing local workers and providing training in sustainable production techniques, Green Bio Energy not only addresses climate change through the reduction of deforestation and greenhouse gas emissions but also supports vulnerable populations by creating stable, climate-resilient jobs. This illustrates how employment practices can be strategically adapted to both mitigate climate impacts and foster economic resilience in the face of environmental challenges.

Ija Trapeznikova, an Associate Professor at Royal Holloway University of London, shared findings from her project "Women's Employment and Family Decisions in Sub-Saharan Africa," co-authored with Ahu Gemici and Juan Pablo. Utilising microdata, this research delves into the labour markets of women in low-income countries across Sub-Saharan Africa, with a particular focus on Uganda. The study underscores how livelihoods in these regions are

increasingly vulnerable to climate change and environmental shocks. Trapeznikova's work highlights the heightened vulnerability of women, who are more likely to work in the subsistence sector and earn lower wages compared to men. The research emphasises the need for targeted policies to improve women's economic resilience and support their participation in the labour market amidst escalating climate challenges. In this context, initiatives such as providing women with greater access to microfinance and climate-adaptive agricultural training can equip them with the resources to invest in sustainable livelihoods. Additionally, implementing social protection schemes, such as cash transfer programmes tailored to women in rural areas, can help them cushion against climate shocks while promoting their participation in the labour market amidst escalating climate challenges.

Lastly, Yasuka Tateishi from University College London, along with collaborators Ryu Matsuura from Northwestern University and Anton Reinicke from University College London, presented their project "Extreme Rainfall and Firms in Uganda: Private Sector Development in the Era of Climate Change." This study investigates the impact of extreme rainfall on urban firms, using administrative data from the Uganda Revenue Authority on 30,355 formally registered firms. The research provides a comprehensive analysis of how extreme weather events affect business operations and productivity, highlighting the broader implications for the private sector in Uganda. The findings underscore the necessity for firms to integrate climate resilience into their operational strategies to mitigate the adverse effects of climate change and ensure sustainable economic development.

## **Transport and urbanisation**

Transportation and urbanisation are critical elements in Uganda's development trajectory, deeply influencing economic growth, environmental sustainability, and climate resilience. Rapid urbanisation, driven by population growth and rural-to-urban migration, has significantly increased the demand for transportation infrastructure and services. This surge in demand often leads to severe congestion, escalating air pollution, and heightened carbon emissions in urban areas. For instance, Kampala, Uganda's capital, frequently experiences gridlocked traffic, contributing to poor air quality and substantial greenhouse gas emissions. The current transportation infrastructure is struggling to keep pace with this growth, resulting in inefficient urban mobility and accessibility, exacerbating socioeconomic disparities. Marginalised communities face limited access to essential services, further entrenching poverty and inequality. Addressing these issues requires a multifaceted approach that emphasises sustainable urban development, integrated transport planning, and the adoption of low-carbon transportation solutions.

The relationship between climate change and urbanisation in Uganda is complex, with its 15 officially declared urban centres being increasingly vulnerable to climate-related impacts such as flooding, heatwaves, and water scarcity, which are exacerbated by inadequate infrastructure and poor urban planning. The impervious surfaces in cities, combined with insufficient drainage systems, lead to frequent flooding during heavy rains, disrupting daily life and causing economic losses. Additionally, the urban heat island effect, where urban areas experience higher temperatures than their rural surroundings, intensifies the impact of heatwaves, affecting public health and energy consumption. Integrating climate resilience into urban and transport planning can enhance the ability of cities to cope with these extreme weather events and reduce their carbon footprint. By prioritising comprehensive strategies that address urban mobility challenges and promote sustainable development, Uganda can improve urban liveability, mitigate environmental impacts, and drive inclusive economic growth.

Throughout this session, Juliana Oliveira-Cunha, Policy Economist under the Cities that Work initiative of the International Growth Centre (IGC), led the discussion with a macro perspective channelling the interconnectivity between cities, congestion, and urban mobility in lowering emissions. Her presentation highlighted cities as the best bet for increasing living standards and cushioning against climate shocks, raising the need to address congestion and other urban mobility barriers to curb air pollution effectively. This approach underscores the importance of integrating climate resilience into urban planning to mitigate the adverse effects of climate change. For example, Kampala is piloting a Bus Rapid Transit (BRT) system, which aims to reduce traffic congestion by providing efficient public transportation. By investing in mass public transportation infrastructure and reducing reliance on private vehicles, the city can significantly cut greenhouse gas emissions and lower urban air pollution. Additionally, the expansion of non-motorised transport infrastructure, such as dedicated cycling lanes and pedestrian-friendly zones, further enhances climate resilience. These actions align with the need for high-density urban planning and the prioritisation of urban mobility in national budgets, as recommended to support Uganda's transition to a more climate-resilient and environmentally sustainable future.

Following her, Miriam Katunze of Victoria University Kampala shared macro views and ideas on transport, urbanisation, and climate change in Uganda. Her presentation highlighted general statistical indicators, evidence of climate change impacts on Uganda, informality in city planning, and the integration of climate change considerations into urban planning. She emphasised the necessity of robust urban policies that consider climate resilience to address urbanisation challenges effectively.

Jeanne Sorin from the University of Chicago presented initial project findings from a collaboration with the Kampala City Council Authority (KCCA) and the African Development Bank (AfDB). Titled “Returns to Road Improvements in Kampala,” the project utilises unique datasets from the Google Maps API and two surveys of property owners and real estate brokers. It aims to study the returns to road improvements in Kampala, focusing on local speed, commuting times, mobility preferences, local amenities, environmental amenities (such as dust and flooding), and property values. These findings can inform policies aimed at improving urban infrastructure, thereby enhancing urban mobility and reducing congestion-related emissions.

To complement these insights, Angela Nshimye from AirQo, Makerere University, focused on air quality monitoring and capacity building for informed policy interventions. Her project, titled “Leveraging Partnerships to Address the Interplay Between Transport, Urbanization, and Climate Change in Uganda and Beyond: The Role of AirQo Through Air Quality Monitoring,” addresses the adverse effects of rapid urbanisation and barriers to urban mobility, which increase vulnerability to climate shocks. By monitoring air quality and building capacity for data-driven policy decisions, this project aims to mitigate the environmental impacts of urbanisation and promote sustainable development.

## **Pollution management and environmental policy actions**

Pollution, whether from industrial activities, transportation, or waste disposal, poses serious threats to public health, natural resources, and overall productivity in Uganda. The country faces significant challenges from air pollution caused by vehicle emissions and industrial discharges, leading to respiratory diseases and environmental degradation. Plastic pollution and improper waste management further exacerbate water contamination, soil degradation, and loss of biodiversity. Addressing these multifaceted issues requires comprehensive environmental policies and effective regulatory frameworks that prioritise pollution prevention, control, and mitigation measures.

By implementing robust management strategies and enforcing stringent environmental regulations, Uganda can significantly enhance its economic competitiveness, attract foreign and domestic investment, and safeguard the health of its population. Effective air quality monitoring, waste management systems, and plastic reduction initiatives are essential components of this strategy. This session aims to delve into the key issues surrounding pollution management and environmental policy actions in Uganda, highlighting the potential for green innovation. Emphasising sustainable practices can lead to job creation, promote economic resilience, and ensure a healthier environment. By integrating these approaches into the national strategy, Uganda can pave

the way for a sustainable future that balances economic growth with environmental stewardship.

With this in mind, Mychaela Paetow from the University of Southern California presented initial pilot study findings on “Waste Management Practices and Plastic Pollution: Global Insights and Local Actions.” Her study focuses on solid waste management, highlighting the waste management issues prevalent in developing countries, including Uganda. Paetow emphasised the environmental and health impacts of inadequate waste management, pointing out that improper disposal practices contribute significantly to pollution and public health crises. She suggested policy responses that include the establishment of effective waste management systems, public education campaigns on waste reduction, and the implementation of recycling programmes. These recommendations are crucial for Uganda to manage its waste more effectively, reduce plastic pollution, and mitigate its impact on climate change and public health.

On the other hand, Tommaso Porzio from Columbia University presented research on “Firms Exposure to Environmental Risks,” a collaborative project that examines the drivers of firms’ location choices, their adaptation to environmental risks, and measures to improve firm clustering and resilience to environmental threats. The findings of this project are particularly relevant to Uganda, as they provide insights into how firms can adapt to and mitigate the risks posed by climate change and pollution. For instance, Roofings Group, one of Uganda’s leading steel manufacturers, has implemented solar energy systems to power its operations, significantly reducing its reliance on fossil fuels and minimising carbon emissions. By transitioning to renewable energy, Roofings Group not only mitigates its environmental footprint but also ensures energy security amidst Uganda’s growing electricity demand and climate-related risks. Porzio’s work underscores the need for policies that support sustainable business practices, encourage firms to adopt green technologies, and promote environmentally resilient infrastructure. By implementing these measures, Uganda can foster an economic environment that is both competitive and sustainable, enhancing the resilience of its businesses to environmental threats.

To close this session, Godwin Kamugisha, Strategic Planning and Partnerships Manager at the National Environment Management Authority (NEMA) Uganda, discussed NEMA’s efforts and mandate concerning pollution management and environmental protection. His presentation provided a comprehensive situation analysis, detailing the impact of pollution on Uganda’s environment and public health. Kamugisha highlighted the actions taken by NEMA, such as enforcing environmental regulations, conducting pollution control programmes, and promoting public awareness. He also outlined lessons learned and future

strategies needed to unlock opportunities for sustainable development and climate resilience in Uganda. His recommendations included strengthening regulatory frameworks, enhancing inter-agency coordination, and increasing investment in environmental protection initiatives. These actions are vital for Uganda to effectively manage pollution, safeguard its natural resources, and build a sustainable future.

## **Agriculture and climate resilience**

Agriculture stands as the backbone of Uganda's economy, providing livelihoods for a significant portion of its population. However, the sector faces challenges exacerbated by climate change and deforestation. The latter, often driven by agricultural expansion, not only contributes to greenhouse gas emissions but also disrupts local weather patterns, leading to erratic rainfall and prolonged droughts. This, in turn, negatively impacts agricultural productivity, food security, and rural livelihoods, perpetuating a cycle of poverty and vulnerability. By promoting climate-smart agricultural techniques, agroforestry, and sustainable land management practices, we can enhance resilience and protect natural ecosystems. This session aims to explore innovative strategies and policy interventions that integrate agriculture and forest conservation to mitigate climate change effects while fostering inclusive and sustainable growth in Uganda.

Agriculture remains the cornerstone of Uganda's economy, supporting the livelihoods of over 70% of its population. Yet, climate change poses significant threats to the sector, manifesting in unpredictable weather patterns, increased frequency of extreme weather events, and shifts in agricultural zones. These changes have severe implications for crop yields, livestock productivity, and food security. Adopting climate-resilient agricultural practices is critical to safeguarding the sector. Techniques such as drought-resistant crop varieties, efficient water management systems, and soil conservation methods can help farmers adapt to the changing climate and maintain productivity.

Furthermore, integrating climate resilience into Uganda's agricultural policies is essential for sustainable development. Policies that encourage agroforestry, which combines agriculture and forestry to create more diverse, productive, and sustainable land-use systems, can significantly enhance climate resilience. Sustainable land management practices, such as crop rotation and organic farming, not only improve soil health but also reduce greenhouse gas emissions. This session highlighted the importance of these practices and explore policy interventions that can support their widespread adoption. By focusing on innovative strategies and comprehensive policy frameworks, Uganda can build a resilient agricultural sector capable of withstanding climate challenges and ensuring food security for its population.



Russell Morton from the University of Michigan presented a project titled “Quality Incentives and Upgrading in Uganda’s Coffee Supply Chain.” This research investigates how intermediation affects quality incentives and investments within Uganda’s coffee supply chain, covering the largest exporters and their suppliers in Western Uganda from 2018-2022. The findings emphasise the importance of quality incentives in encouraging farmers to adopt better practices, which can lead to increased productivity and resilience to climate impacts. By aligning incentives with quality improvements, farmers are more likely to invest in sustainable farming techniques that enhance climate resilience. Policy implications from this study suggest the need for government and private sector collaboration to create frameworks that reward high-quality, sustainable agricultural practices, thus promoting long-term environmental and economic benefits.

Ameek Singh from the London School of Economics discussed the “Building and Managing Relationships with Farmers: Evidence from the Rwanda Coffee Sector” project. This initiative, in partnership with the biggest coffee buyer in Rwanda, launched a Farmer Development Program (FDP) to build relational contracts with coffee farmers. The FDP included a bundle of services offered to farmers in exchange for performance and training sessions on relationship building. The presentation highlighted how relational contracts can alleviate constraints for farmers, enabling them to invest in productivity and climate resilience technologies. The policy implications underscore the need for similar programmes in Uganda that focus on strengthening farmer-buyer relationships, enhancing trust, and ensuring farmers have the necessary support to implement climate-smart practices. Such relational contracts could be pivotal in fostering a resilient agricultural sector that can better withstand climate shocks.

Mohammed Abouaziza from the London School of Economics presented “Finance for Agricultural Markets in Africa,” a project exploring the link between agricultural firms’ growth and resilience to climate shocks and access to finance. This study, conducted in partnership with a facility providing financial incentives to formal lenders in East Africa, surveyed loan officers to evaluate the impact of these incentives on credit supply and SME outcomes. The findings highlight the critical role of access to finance in enabling agricultural firms to invest in technologies and practices that enhance climate resilience. Policy recommendations from this research include the development of financial products tailored to the needs of agricultural SMEs, incentivising lenders to extend credit to climate-resilient projects, and implementing supportive policies that facilitate easier access to finance for farmers. Such measures are essential for building a robust agricultural sector capable of adapting to and mitigating the effects of climate change.

Peter Babyenda, a lecturer at Makerere University Uganda, presented an exploration of the intersection between Uganda's agricultural sector and climate change, focusing on the sector's extreme vulnerability to climate shocks and potential policy options. His presentation underscored the urgent need for policies that integrate climate resilience into agricultural planning and development. Additionally, Rehema Kahunde from the Economic Policy Research Centre highlighted in her study, "How Specific Resilience Pillars Mitigate the Impact of Drought on Food Security," the components of resilience among households. This study, using data from the Uganda National Panel Surveys (UNPS), seeks to identify the most effective resilience pillars in mitigating the impact of drought on food security in Uganda. Kahunde's findings emphasise the importance of building robust social safety nets, enhancing access to climate-resilient agricultural inputs, and promoting diversified livelihoods to strengthen household resilience against climate-induced food insecurity. These insights underscore the need for comprehensive policy interventions that address the multifaceted challenges posed by climate change to Uganda's agricultural sector.

## **Green finance and carbon markets**

Green finance is emerging as a pivotal catalyst for Uganda's transition to a low-carbon and climate-resilient economy. In a country where traditional financial mechanisms often fall short in addressing the unique challenges of climate adaptation and mitigation, green finance offers a transformative solution. For instance, Uganda's Nationally Determined Contributions (NDCs) under the Paris Agreement highlight the need for substantial investment in renewable energy, sustainable agriculture, and efficient waste management to achieve its climate goals. Leveraging climate funds, such as the Green Climate Fund (GCF) and other impact investments, Uganda can mobilise the necessary resources to implement these climate-smart projects. These investments not only reduce greenhouse gas emissions but also enhance energy security, food production, and overall economic resilience, thereby driving sustainable development.

Additionally, the potential of carbon markets in the country cannot be overstated. By participating in global carbon trading schemes, Uganda can attract significant investments aimed at reducing greenhouse gas emissions through initiatives like reforestation, conservation agriculture, and clean energy projects. For example, the Kibale National Park project, which focuses on reforestation, has already demonstrated success in generating carbon credits and attracting international investment. The project has helped restore over 10,000 hectares of degraded land and generated over 300,000 verified carbon units (VCUs), contributing to Uganda's climate mitigation goals. Another notable initiative is the Nile Basin Reforestation Project, part of the Clean Development

Mechanism (CDM), which aims to reforest nearly 4,000 hectares and has already sequestered over 1.6 million tons of CO<sub>2</sub> since its inception. These efforts help Uganda meet its climate commitments while providing economic benefits such as job creation and poverty reduction. Revenue from carbon credits, such as the nearly \$1.2 million generated annually by various carbon projects, can be reinvested into local communities, enhancing infrastructure, healthcare, and education, thereby improving living standards. Furthermore, by aligning with the National Environment Management Authority's (NEMA) agenda and collaborating with international partners, Uganda can strengthen its climate resilience and ensure that urban growth is both inclusive and environmentally sustainable.

Drawing from his forthcoming book, "The Political Economy of Climate Finance Effectiveness in Developing Countries: Carbon Markets, Climate Funds, and the State" (Oxford University Press, 2024), Purdon provided a macro perspective on the complexities and challenges of climate finance in developing nations. He emphasised how carbon markets and climate funds can be leveraged to achieve significant emission reductions and support sustainable development. His insights highlighted the need for Uganda to establish clear and transparent regulatory frameworks to facilitate carbon trading and ensure the efficient allocation of climate funds. This foundation set the tone for an in-depth discussion on integrating these mechanisms into Uganda's national strategies, ensuring that climate finance contributes to both economic growth and environmental sustainability.

Building on Purdon's macro perspective, Bob Munene from the Ministry of Finance, Planning, and Economic Development, expanded on the government's efforts to incorporate green finance into Uganda's financial policies. Munene emphasised creating a robust regulatory framework to facilitate the flow of climate finance and attract investment in sustainable projects. He outlined recent initiatives aimed at enhancing financial services and promoting green investments, highlighting the critical role of government policy in driving the transition to a low-carbon economy. This was further complemented by Mary Gorret Nantongo's academic perspective, who discussed ongoing research initiatives at Makerere University Business School that focus on sustainable finance and the development of innovative financial instruments to support climate resilience. Nantongo stressed the importance of education in building local capacity and fostering a culture of sustainability, which can empower future leaders to champion green finance initiatives.

Lastly, Sam Mugume addressed the broader economic implications of integrating green finance into national policy. Mugume outlined the potential economic benefits, including job creation, poverty reduction, and increased foreign investment, that can arise from a robust green finance strategy. He

discussed the importance of aligning green finance initiatives with Uganda's macroeconomic policies to ensure coherence and maximise impact. His policy implications included the need for macroeconomic stability to attract green investments, incorporating environmental sustainability into economic planning, and promoting regional cooperation to address cross-border environmental challenges.

Together, these presentations painted a comprehensive picture of the multifaceted approach needed to harness the potential of green finance and carbon markets in Uganda. By drawing on diverse perspectives from government, academia, and the private sector, the roundtable underscored the critical steps required to build a sustainable, resilient, and inclusive economy.

### **Green energy for sustainable development**

Advancing green energy initiatives is essential for Uganda's sustainable development, providing a strategic avenue to reduce carbon emissions, bolster energy security, and stimulate economic growth. The country's rich natural resources offer substantial potential for harnessing solar, wind, and hydroelectric power, enabling a shift from fossil fuels to more sustainable energy sources. Currently, renewable energy makes up about 92% of Uganda's electricity supply, primarily through hydroelectric power. However, significant opportunities remain to expand into solar and wind energy. By focusing on these green energy solutions, Uganda can sustainably meet its increasing energy demands, create jobs, improve public health by reducing pollution, and mitigate environmental degradation.

To expedite Uganda's green energy transition, several actionable policy recommendations have been proposed. Developing a comprehensive national renewable energy strategy with specific targets and timelines for adopting various renewable energy sources is paramount. This strategy should be bolstered by a robust regulatory framework that streamlines the approval process for renewable energy projects and provides incentives, such as tax breaks and subsidies, to attract private sector investment. Moreover, integrating renewable energy education into the national curriculum and fostering partnerships between universities and the private sector is critical for cultivating local expertise and driving innovation. Strengthening infrastructure, including upgrading the national grid to manage intermittent renewable energy supplies, is also essential. Implementing these recommendations will enable Uganda to unlock significant economic opportunities, attract international investment, and establish itself as a leader in sustainable energy development, ensuring a resilient and prosperous future for its population and economy.

## Further reading and policy recommendations

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For those interested in delving deeper into the sessions and roundtables discussed above, we have compiled a series of policy notes that provide detailed analysis and key policy recommendations. These notes are designed to offer actionable insights and strategic guidance, drawn from the expert discussions and case studies presented during the conference. In addition, a comprehensive policy inventory has been developed for your reference, which outlines existing policies and frameworks relevant to advancing climate resilience and sustainability in Uganda. By reviewing these documents, stakeholders can gain a deeper understanding of the critical issues addressed and explore evidence-based solutions tailored to advancing climate resilience and sustainable development. We encourage lecturers and participants to utilise these resources to inform their work and drive impactful climate action.