# Digitalisation and Climate Change:

## Connecting the two agendas for a just climate transition

KICTANet
The Power of Communities
www.kictanet.or.ke

**Published by:**
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**Year of Publication:**
August 2024

**Photo (Title):**
www.freepik.com

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# 1.0 Introduction

**Many low and middle-income countries (LMICs) have embraced digitalisation, which means developing processes and changing workflows to improve manual systems.**

With support from international development partners, governments are undertaking massive projects whose ultimate goal is to deliver services digitally(World Bank Group, 2016). Kenya has several laws, policies and strategies that support digital transformation(Mutung'u, 2023) .

Alongside digitalisation, another urgent agenda is climate change adaptation. Many African countries, including Kenya, have adopted the UN Framework Convention on Climate Change (UNFCCC)(United Nations, 1992). Africa is one of the regions most affected by the impacts of climate change. African countries recognise the existential threat posed by the climate emergency and are already taking steps to address them.

Digitalisation is important in addressing how the climate emergency is playing out in the continent and how African countries and global partners are responding. Kenya has had a climate change law for over 10 years (Climate Action Tracker, 2024). There are also several general and sector specific policies on climate change. The National Climate Change Action Plan (NCCAP) 2016-2022 identified seven key areas for Kenya's Nationally Determined Contribution (NDC) to cut emissions and adapt to climate impacts(Republic of Kenya, 2016a).

According to the United Nations Development Programme (UNDP), African countries have pledged US$264 billion of national resources to implement their nationally determined contributions to climate change(UNDP, 2023). However, Africa still suffers from a critical finance gap since African countries need to invest US$50 billion every year to combat climate change.

This financial shortfall is particularly alarming when compared to the total economic output of African countries, which collectively accounted for around US$2.98 trillion in GDP in 2022. (Africa Development Bank Group 2023) This means the continent must allocate around 1.68% of its total GDP each year just for climate-related needs, a significant strain on economies where many rely on informal sectors that are not captured by GDP measurements.

The debate surrounding the adequacy of GDP as a metric for quantifying climate finance needs is ongoing, particularly given the informal nature of many African economies and the multidimensional impacts of climate change.

In recognition of this, the UNFCCC has been working towards a more accurate methodology for measuring the gap between financial resources and climate action needs. Although there has yet to be a finalized methodology, progress is being made through ongoing reports by the Standing Committee on Finance (UNFCCC, 2023).

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Failure to act will affect 60 percent of Africa's 1.4 billion people who live in rural areas and depend on climate-sensitive livelihoods threatened by water stress, expanding drylands and deserts and sea-level rise. At the same time, ocean acidification and rising temperatures have a negative impact on ocean dependent economies in Africa – particularly those of small island developing states.

These changes will weaken food security, undermine just energy transitions, and push millions more way below the poverty line in Africa. But it could also undermine global economic growth, trigger mass forced displacement, and jeopardize global security. In other words, humanity faces deeply troubling scenarios.

Kenya's National Policy on Climate Finance is a framework for mobilisation of climate finance that contributes to low carbon climate goals(Republic of Kenya, 2016c). Sector specific policies include the Least Cost Power Development Plan (LCPDP)(Republic of Kenya, 2017b) for electricity generation and transmission and the Kenya Climate-Smart Agriculture Strategy (CSA) (Republic of Kenya, 2017a).

Digitalisation has the potential of enhancing climate-smart agricultural productivity, streamlining processes, and contributing to the well-being of communities. In agriculture for example, digital tools are increasingly being used to predict rainfall, link farmers to markets, and provide other important data to farmers (Miriri, 2020; Caribou Digital, 2022).

While digital tools and technologies have positively influenced the livelihoods of farmers and community development, challenges associated with the digitalisation of

agriculture have been identified, including technology adoption, data security, and the socio-economic impact on labour and education (Mirembe, 2021) .

The transport sector is also mandated to report annually through the Transport Sector Climate Change Annual Report (Republic of Kenya, 2022). Besides these national strategies, several counties also have localised laws and action plans(Climate Action Tracker, 2024).

While overlaps exist between digitalisation and climate change, they are often considered separately. Increasingly however, intersections between the two agenda are evident in Kenya. For example, around 2019 when there was increased digital ID advocacy, two groups of civil society organisations (CSOs) working on statelessness and digital rights groups were brought together (Kang'ara, 2022).

While digital ID does not appear related to climate change, statelessness CSOs see a link between digitalisation of people and control of migration occurring because of climate change (Haki na Sheria Initiative, 2011).

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Statelessness advocacy groups had a first-hand experience of the effects of adverse weather and how digitalisation was being used to manage migration and humanitarian assistance.

For example, local communities accessing refugee camps for food and other aid were enrolled into biometric databases that were shared with Kenyan registration authorities. They subsequently faced challenges in accessing citizenship documentation as they were deemed to be refugees.

Another example was during the ongoing reform of ICT laws and policies (Indeje, 2024). During public participation meetings, there was mention of greening the digital economy in comments about infrastructure development. From the climate change adaptation world, digital technologies are viewed as tools to combat development challenges, including environmental management and climate adaptation.

The current administration in Kenya has

prioritised both the digital and the climate change adaptation agenda (Hussein Mohamed, 2022). Plans are underway to adopt a new climate action plan inspired by the UNFCCC, which primarily aims at reducing energy consumption to sustainable levels.

To this end, digitalisation is viewed as a key lever since it reduces the production of materials which can be digitised (converting and recording data), reduces emissions in some industries, and can be employed for more efficient allocation of resources in industry (Peña, 2020).

Digital rights groups, while supportive of digital transformation, are also critical of the inequalities perpetuated by the same technologies. When connected to the climate justice agenda, critiques to digital technologies include their energy consumption as more people shift to the digital economy, electronic waste and extractivism, particularly in the Democratic Republic of Congo (DRC) where the rush for precious minerals required for digitalisation has contributed to civil conflict (APC, 2022).

Labour conflicts between artificial intelligence workers and technology businesses are prevalent, leading to questions about the fairness of the climate transition (Motaung v Samasource Kenya EPZ Limited t/a Sama & 2 others (Petition E071 of 2022) [2023] KEELRC 320 (KLR) (6 February 2023) (Ruling), 2023). Leading civil society thinkers therefore call for a holistic consideration of the intersection between climate change and digitalisation if climate change adaptation is to be just (Peña, 2020).

To be able to assess digitalisation and climate change in Kenya, this brief paints a broad picture of the state of play on matters climate change and digitalisation; identifies areas of intersection or synergy; and proposes areas of work that civil society actors, such as KICTANet could explore.

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# 2.0 State of Play

**Both digitalisation and climate change adaptation are agendas that have been on the radar of successive administrations in Kenya in the 21st Century.**

The current administration which formed the government in 2022, has nearly completely digitised access to public services through the digital ID and e-government (Owalo, 2023). It has also prioritised climate change adaptation, and among other actions, hosted the inaugural Africa Climate Summit and the Africa Climate Week in September 2023.

The Africa Climate Summit, co-hosted by Kenya and the African Union Commission, gathered leaders, development partners, private sector, academia, civil society, women, and youth, emphasizing the nexus between climate change and development, and the need for increased global climate investment, while focusing on the African context ahead of the historic UN Conference on Climate Conference (COP28) in Dubai, UAE in December 2023.

The Africa Climate Week serves as a platform for African policymakers, businesses, and civil society to exchange climate solutions. The regional forums share the continent's common climate change-related goals in addressing agriculture, food security, and sustainable development in the region, focusing on climate resilience, sustainable farming, adaptation strategies, capacity building, and policy advocacy.

Kenya's climate change adaptation is guided by the Climate Change Act of 2016 and the National Climate Change Action Plan (NCCAP) 2018-2022. The legislation and strategy generally adopt the UN UNFCCC framework on sustainable energy.

The action plan has seven key areas – disaster risk management, food and nutrition security, water and the blue economy, forestry, wildlife and tourism, health, sanitation and human settlements, manufacturing and energy and transport (Republic of Kenya, 2016b). Specific targets include 32 percent reduction of greenhouse gas emissions by 2030 (Republic of Kenya, 2016b, p. 5).

The framework views digitalisation both as a key and supportive tool for climate change adaptation. NCCAP envisages the use of digital technologies in disaster risk management, manufacturing and energy and transport through technologies such as smart manufacturing expected to reduce energy expenditure (Republic of Kenya, 2016b, p. 22).

Artificial intelligence (AI) is identified as a technology that could provide accurate data to mitigate extreme weather in the agricultural sector while more generally, digital technologies are also contemplated as key in monitoring and reporting of climate change adaptation activities in all the areas of work (Republic of Kenya, 2016b, p. 22).

Besides the national framework, there are also

sub-structures in various sectors and private businesses. The Central Bank of Kenya (CBK)- the financial regulator, published a Guidance on Climate Related Risk Management in October 2021(Guidance on Climate-Related Risk Management, 2021). Following the guidance and accelerated by social distancing measures adopted during the COVID-19 pandemic, many banks digitised their systems in a bid to reduce on paper.

Banks also collect quantitative metrics for tracking and monitoring climate-related risks as advised by the CBK guidance. Recently, CBK announced that it was developing more measures for climate change adaptation, including higher capital requirements to mitigate climate risks as well as a green investment taxonomy (Lee, 2024).


There are several examples of corporations undertaking commitments under environmental, social and governance (ESG) policies. Mobile network operator Safaricom aims to become a net zero carbon emitting company by the year 2050 (Safaricom, 2022). There are many other enterprises of all sizes that have either committed to emission goals or manufacture products that support climate change adaptability. Overall, digital technologies are viewed as advantageous to climate change adaptation.

In terms of digitalisation, Kenya has an ambitious digitalisation plan anchored in the Digital Economy Blueprint (Republic of Kenya, 2019a). The policy identifies five pillars – digital infrastructure, digital government, digital business, innovation-driven entrepreneurship, and digital skills and values. It views digitalisation as a means to improve Kenya's competitiveness as a climate-responsive digital hub. While the document is scant on how to achieve climate goals, previous plans have more specifics.

Kenya ICT Policy (2019) for example links information and communications (ICT) development to other national goals, including environmental protection (Republic of Kenya, 2019b). It identifies three broad areas for

policy intervention such as the use of ICTs for climate change adaptation in modelling, monitoring and early warning for disaster mitigation, the utilisation of ICTs of high environmental and safety standards, and e-waste disposal management(Republic of Kenya, 2019b, p. 19).

The policy foresaw a self-regulatory environment with private actors providing products and services along policy goals and government providing incentives for specific areas such as ICT waste disposal as well as the use of ICTs for climate goals such as water tower restoration.

Other actions related to climate change and digitalisation are environmental impact reporting for telecommunications companies. The companies are required to submit periodic reports to the National Environmental Management Authority (NEMA) which is the environment coordination body, and adhere to infrastructure deployment codes (Code of Practice for the Deployment of Communications Infrastructure in Kenya, 2017).

Such codes play a role in environmental management objectives including exposure standards and waste management. Their alignment with climate change adaptation goals such reducing emissions however needs to be studied and strengthened where need be.

An ongoing process for the review of Kenya's digital frameworks makes mention of greening digital technologies. Greening refers to a holistic approach encompassing low carbon, resource efficient and socially inclusive approaches to climate change mitigation (UNEP, 2018). While common understanding of a green economy is still being developed, examples of green infrastructure in Kenya could include localised community networks that are more energy efficient (Connecting the Unconnected project team, 2020).

Kenya is a leader in community networks, having developed a special licensing framework for the infrastructure (Communications Authority, 2021). However, more needs to be done to sensitise existing and potential communities on green aspects by making resource-efficient choices when procuring equipment. These examples show a permeation of the climate change adaptation agenda into digitalisation and vice versa. At a theoretical level, there is debate about the impact of capitalism and other human activities on the environment and climate change (Peña, 2020).

Some argue that given the depth at which humanity has invested in digitalisation, the only path is forward (Schwab, 2017) . On the other hand, there are arguments for slowing down human activity to protect against environmental degradation and climate change (Kwet, 2022). While these debates take place in Western societies, countries such as Kenya view both issues – climate change and digitalisation – as levers for development.

The Digital Economy Blueprint for example views digital transformation as a means for the elevation of existing economic activities and the creation of new ones. Climate adaptation is also viewed as an opportunity for in-

novation as well as fundraising through new revenue streams such as carbon credit trading (Omondi, 2023).

From this practical point of view, the intersection between digitalisation and climate change adaptation includes climate change mitigation and information management. To mitigate the effects of climate change, digital technologies such as simple digitisation of paper, video and audio, AI and smart technologies can be employed to meet climate change adaptation goals such as reduced energy consumption and carbon emission.

These technologies can also be used to collect and process data on various aspects of climate change mitigation. While it powers positive correlations, digitalisation also has negative effects on climate change adaptation. These can be broadly classified as infrastructure and devices, and safety and information environment issues. Examples of issues under each basket are listed in Table 1 below.

**Table 1: Negative effects of Digitilisation**

| Infrastructure and devices | Safety | Information environment |
|---|---|---|
| • High energy consumption by digital infrastructures such as data centres<br>• High water consumption by digital infrastructures such as data centres<br>• Overconsumption of devices such as phones designed to be replaced very often.<br>• Overconsumption of devices as people smarten their cars, home equipment, homes, cities etc. | • Unsafe mining for components of digital infrastructure<br>• Irresponsible disposal of e-waste<br>• Lack of comprehensive knowledge on the health and environmental effects of digital technologies<br>• Unseen and lowly-paid labour as more functions move online to mitigate climate change effects. | • Information disorder where misinformation and disinformation are spread online<br>• Lack of access to important information for climate change adaptation<br>• Lack of capacity to follow and influence digital standards for climate change mitigation. |

# 2.1 Infrastructure and devices

**While digital technologies dematerialise artefacts such as paper, virtual products still require infrastructure such as cloud storage facilities. Such facilities are the unseen but key part of digital experiences such as virtual meetings, currency and reports.**

Cloud infrastructure requires data centres and a group of networked servers to support storage, processing and distribution of information remotely.

Environmental concerns around data centres include their massive energy and water requirements. For example, data centres are estimated to consume 3 percent of the world's generated electricity, with a typical data centre consuming about 26 million litres of water per year (Thangam, et. al, 2024). Data centres are therefore set up near large sources of water, often resulting in conflict and competition with other water users (Bartlett, 2024).

Indirect environmental concerns include the massive financial investment required to establish a data centre. Where states are involved as in the case of Kenya's latest data centre initiative, investors are likely to be protected from processes through which human rights are protected.

Such concerns have been raised after the announcement of a partnership for a 1GW data centre in Naivasha, Kenya by President William Ruto (Mwangi, 2024). While the project will utilise geothermal energy, a green source which has a reduced carbon footprint, questions of water and financial sustainability abound. There is therefore concern that once the project is in operation, sensitive data may be traded, resulting in human rights violations.

While these concerns abound, businesses continue to encourage integration of technology in almost every aspect of life. For example, telecommunications companies, banks and e-commerce service providers are all diversifying their business into new streams such as the internet of things (IoT) (Ngugi, 2021). Technologies such as the internet of things increase the manufacturing and usage emission, as more neighbourhoods and homes acquire electronic devices.

Internet and mobile telephony devices more broadly are designed to be used for a few seasons and be replaced with newer versions. As a country with an impressive mobile telephony penetration, Kenya has attracted mobile phone dealers who market the devices as limited duration consumer goods that must be changed often. Without

a commensurate policy on e-waste, there is likely to be an increase in discarded mobile and other digital devices. Measures such as establishing e-waste recycling centres and raising consumer awareness about responsible disposal are crucial to promote sustainable digitalisation. Policies that encourage extended producer responsibility can also incentivize manufacturers to design longer-lasting, recyclable digital products

## 2.2 Safety issues

US companies announced several agreements for the technology sector during President Ruto's state visit in May, including the development of a green data centre and a semiconductor manufacturing plant. These developments place the country in a dilemma because while they are likely to increase direct and indirect employment, they also risk increased emissions from manufacturing. The presence of semiconductors may also encourage the manufacture and ownership of digital devices, in the process increasing usage emissions.

Other safety issues are related to construction of the digital space. While there is currently no extraction of rare earth elements required for the manufacture of digital devices, despite the discovery of deposits in some locations in the country, the resources extracted in other countries have indirect effects. Conflict in the DRC, where most of the elements are extracted from could result in an influx of refugees into Kenya.

An emerging area which directly affects Kenyans and Africans in general is digital labour. Ongoing litigation shows how lowly paid workers construct AI products such as automated content moderation and generative AI through training models that are subsequently automated. Workers are not only paid low wages, but they also suffer mental harm by being exposed to the worst of the information disorder (cruel and racist content, pornography, violence etc).

## 2.3 Information environment

A second set of concerns arises from how the information environment is used in the climate change adaptation agenda. As a country near the Equator, Kenya is already experiencing adverse weather and other effects of climate change. At the same time, the country has a relatively high internet penetration which, among other benefits, serves as a space for vibrant conversations (Nyabola, 2018).

This public sphere is also used to spread misinformation and disinformation related to climate change and conflicts arising from scarcity of natural resources. For example, during the issuance of the first 5G licences in the country, misinformation on the health and safety of the technology abounded, leading to fear and suspicion among the public (KICTANet, 2021). It was reminiscent of a previous era when misinformation about the safety of mobile phones translated into a business opportunity where traders sold attachments

that could supposedly cancel harmful waves when stuck to mobile phones. The rise in stakes, as well as conflicts related to climate are increasing the risk for pollution of the information environment not only through misinformation and disinformation but also puts at risk climate justice advocates and activists (The Engine Room, 2023). Misinformation and disinformation also thrive where there is not enough credible information on the subject issue, making it important for climate justice advocates to be present in the digital space to raise public education and awareness (APC, 2022).

Despite their experience in the building of digital platforms, very few Africans are involved in the setting up of standards for a just climate transition. This is partly due to lack of capacity for sustained engagement with both digital and climate change forums.

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**Photo:** www.freepik.com

# 3.0 KICTANet's experience in climate change and digital work

**KICTANet is among Kenya and Africa's well-known digital policy research and advocacy organisations, with experience spanning close to 20 years (KICTANet, 2017).**

A scan of published KICTANet output shows that while the organisation has participated in climate change work, its engagement has not been not systematically sustainedengaged in climate change work. It has however participated in the development of many digital policy frameworks.

As a network with a diverse membership, there has been mention of climate change adaptation mechanisms for the digital sector. In 2008, the network undertook a comprehensive study of e-waste management in Kenya (Waema & Mureithi, 2008). The study anticipated that e-waste would increase with digital development.

It recommended development of e-waste regulations to govern its collection and disposal as well as icensing of stakeholders (Waema & Mureithi, 2008, p. 34). While a policy was eventually developed, there are still gaps in e-waste collection centres.

> ***KICTANet's experience with climate change adaptation are reflective of the general state where the two agendas have not been considered alongside each other. Nevertheless, the increasing convergence of the two issues calls for KICTANet and other partners in digital policy work to apply a climate justice lens in their work***

At a recent public participation exercise on recommendations for the ICT sector, climate change issues were mentioned regarding digital services and data centres (Indeje, 2024). Comments were made on 'greening ICT' with a view to adopting ICT standards most favourable to a just climate transition.

A review of earlier works, including the first ICT policy discussion shows that issues of climate change adaptation were also mentioned, although they were not considered in a dedicated way. Unlike other policy advocacy issues, their im-

plementation does not appear to have been monitored.

KICTANet's experience with climate change adaptation are reflective of the general state where the two agendas have not been considered alongside each other. Nevertheless, the increasing convergence of the two issues calls for KICTANet and other partners in digital policy work to apply a climate justice lens in their work. KICTANet has experience with linking agendas, as evidenced in its gender and accessibility work.

How then can the organisation contribute to climate change adaptation policies, particularly where digital policy is affected? Inspired by recent publications on climate change and digitalisation, some of the pathways forward include:

## 3.1 Learning

While this brief has pointed out some of the intersections between climate change adaptation and digitalisation, there are gaps on the politics and other issues of concern from a climate justice perspective. This scenario calls for KICTANet to collaborate with climate justice organisations to uncover and prioritise areas for policy research and advocacy. Examples of learning activities or questions include:

- A taxonomy of what greening digital technologies in Kenya include, with a special focus on often neglected aspects such as community involvement and sustainability.
- Advocacy on more comprehensive policies on climate just digitalisation.
- Reflections on resolving some of the dilemmas of digitalisation and climate change, for example, how to bridge the digital divide in a climate-centric way.
- Reflections on digitalisation and climate change among vulnerable and marginalised groups such as rural women, people without access to digital technologies and low-income households.

Such reflections could help engender climate justice issues in digitalisation discourse.

## 3.2 Collaboration

Kenya's climate change adaptation policies seem positively biased towards ICT as a lever for climate change monitoring and reporting. On the one hand, the National Policy Plan mentions crypto-banks as a tool for recording data without considering whether there are less resource-hungry tools available or how to mitigate against cryptos' high energy demands (Republic of Kenya, 2016b).

On the other hand, projects such as digitalisation of personal identity (digital ID) do not consider the high energy cost of recording every person's transactions with the government (as is envisaged under the Maisha Namba project). The projects are also

oblivious to the digital literacy and access divide, as well as how historical barriers and climate change contribute to people lacking identity documentation.

Applying a climate justice lens to a project such as the digital ID could not only increase the chances of successful advocacy, but also create spaces through which different advocacy groups can collaborate. Examples of activities that could be undertaken under this stream include:

- Development of resources on greening digital infrastructure for community advocacy.
- Joint research and advocacy in models such as business and human rights in climate change adaptation and digitalisation issues.
- Joint responses and advocacy on policy processes on digitalisation and climate change.

## 3.3 Mutual Support

KICTANet could learn from climate justice organisations, and noting that it has experience in supporting digital rights organisations safety, this could also be extended to climate change organisations. This would be important to those organisations in the grassroots who while very well versed with climate change adaptation, may not be as experienced with issues such as digital safety. They would thus require:

- Provision of digital safety training and resources for climate justice networks and organisations.
- Creation of spaces where climate justice networks share knowledge with digital rights counterparts and vice versa.
- Development of guides for climate adaptation in climate justice and digital rights organisations tackling organisational issues such as resource management, community engagement, digital safety and e-waste management within advocacy organisations.

# Conclusion

Digitalisation and the climate change adaptation agenda have many similarities. They are both prioritised in low- and middle-income countries such as Kenya, making them key targets for policy changes.

Like many global issues, the two agendas are guided by globally set policies which at times miss the local nuances. One such example is greenwashing, where policymakers and other stakeholders superficially adopt measures such as reduction of emissions in one area of their business while contributing to emissions in another area or in their supply chain. This makes it urgent to consider holistic solutions. For civil society organisations, part of a comprehensive approach involves partnering with climate justice organisations to learn, undertake joint advocacy and mutually assist each other.

# 4.0 Recommendations for Digitalisation and Climate Change agendas for a just climate transition

**Connecting the digitalisation and climate change agenda is necessary to achieve a just climate transition. Policymakers and funders, civil society organisations can address the challenges associated with using digital technologies to address climate change by:**

## 4.1 Policymakers

- Need to expand their stakeholder maps to include not only sector specific advocacy organisations but also climate justice organisations in the case of digital policymakers and digital rights organisations in the case of climate change policymakers.

## 4.2 Funders

- Need to apply a broad lens to both climate justice and digitalisation work and support knowledge exchange among organisations working on the two issues.
- Need to support learning, joint advocacy and mutual support among digital rights and climate change organisations for a just climate transition.
- Need to amplify emerging work that connects the two issues.

## 4.3 Organisations

- Shift their strategies to connect the two issues in their work. This can be achieved by collaborating with other organisations.
- For civil society organisations, they should adopt a comprehensive approach that calls for partnering with climate justice organisations to learn, undertake joint advocacy and mutually assist each other.

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