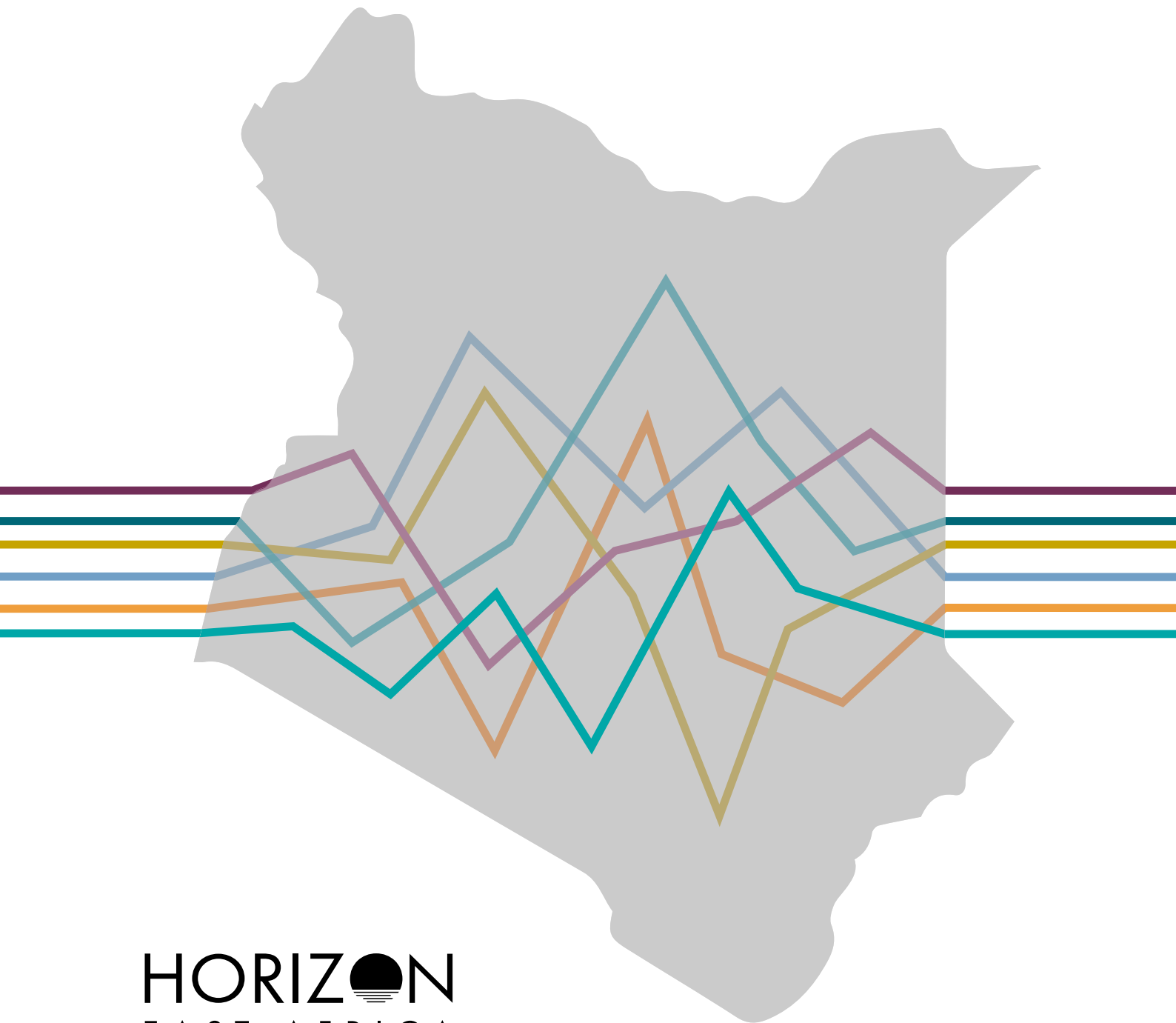


# Horizon Kenya

*Exploring trends set to shape the future in Kenya*

CHAPTER 6 OF 6:

## ENVIRONMENT



**Horizon East Africa** is a research project dedicated to exploring the trends that are likely to shape the future in East Africa. It aims to contribute to the conversation about what may lie on the horizon so that governments, donors, firms and citizens can take the action needed now to better mitigate looming risks and most effectively grasp the opportunities to come.

We synthesise global, regional and country-level data and research, and complement this with our own targeted intelligence-gathering from strong networks in East Africa.

This first Horizon East Africa report (compiled in 2019) looked at regional trends, while this second series provides more in-depth analysis into the key trends likely to shape the future of Kenya, considering the impact of COVID-19 on the country's prospects for economic transformation moving forward.

Horizon reports aim to trigger debate and discussion. We welcome conversations with others about this report's content — including about the implications of its findings and areas that need further research.

We also welcome collaboration on future projects. Please connect with us @horizon\_ea or contact us at info@horizon-ea.com to register your interest and to sign-up for future updates.

Horizon East Africa is supported by Msingi, Kenya Markets Trust and Gatsby Africa.

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# Environment

## *A Changing Climate Moves Environment Up The National Agenda*

### PART A: UNDERLYING TRENDS

**Compounding human-induced land degradation, climate change is set to harm agricultural production and exacerbate conflicts over natural resources.**

Kenya's climate has become more volatile in recent years and this trend appears set to continue, as temperatures rise and extreme weather events become more frequent.

The country's land is becoming less productive – at a time of rapid population growth and urbanisation. By 2040, food consumption is expected to outrun production by 20 million metric tonnes.

There are growing tensions over land and water.

**Owing to increasing public pressure, efforts to mitigate climate change and conserve land will intensify.**

Signalling a commitment to change, the government has enacted important environmental legislation in recent years, such as the plastic bag ban in 2017 and the National Climate Change Action Plan 2018–2022.

Stronger and more concerted action is necessary, but there are reasons to be optimistic that change is possible in the short-term (due to grassroots activism), medium-term (due to the use of climate-smart tech) and long-term (due to greater regional & global collaboration).

### PART B: IMPACT OF COVID-19 ON ENVIRONMENT IN KENYA

**Emerging amid extreme climate events, COVID-19 has stressed Kenya's food system.**

### PART C: CONCLUSION

**What might climate change mean for economic transformation?**

Export-oriented sectors are leading the way in driving higher environmental standards, but could benefit from further government commitment to a green agenda.

Concerted focus on the water sector is needed, and in particular a shift towards widespread irrigation schemes to protect the agriculture from climate volatility.

The transformation of Kenya's agricultural sector will nonetheless need more than irrigation.

## **PART A:**

# **UNDERLYING TRENDS**

## **Compounding human-induced land degradation, climate change is set to harm agricultural production and exacerbate conflicts over natural resources.**

**Kenya's climate has become more volatile in recent years and this trend appears set to continue, as temperatures rise and extreme weather events become more frequent.**

Since Kenya's economy is largely agrarian, climate change and land degradation are issues set to have a significant and negative impact on inclusive growth.<sup>1</sup> Changing temperatures and poor land management practices are resulting in widespread soil erosion and nutrient loss, desertification, biodiversity loss, and water scarcity.

Kenya is highly prone to drought: only 20% of the country's territory experiences high and regular rainfall while the remaining 80% is arid or semi-arid (i.e. receives rainfall of 200 to 500 mm per year).<sup>2</sup> However, while periodic droughts and flooding have long been a part of Kenya's climate system, the frequency of extreme weather events is on the rise.<sup>3</sup> Recent events include the widespread flooding in October 2019, which affected more than 100 000 people, and a drought emergency in February 2017, which affected 23 out of Kenya's 47 counties and doubled the number of food insecure people (from 1.3 million to 2.7 million).<sup>4</sup>

The increasingly unpredictable climate in Kenya is impacting food production. According to a study by the UN's Food and Agriculture Organisation (2020), the overall cereal output in East Africa in 2019 dropped by 8.2% from the previous year as a result of weak precipitation, with Kenya recording the largest loss of yield at -19%.<sup>5</sup> Indeed, droughts in Kenya have inspired a 99% reduction in maize production in coastal areas compared to the long-term average.<sup>6</sup> Since a significant share of Kenya's GDP and workforce rely on agriculture, reductions in farm output have a substantial impact at a macroeconomic and household level.<sup>7</sup>

The climate in Kenya is expected to become more extreme: The World Bank projects the mean annual temperature will rise 1.8°C–2.8°C by 2050.<sup>8</sup> Meanwhile, over the same period, mean annual precipitation is set to rise by 67.4 mm, with increases in rainfall most pronounced in October, November and December (when rainfall will rise from -3 mm to +49 mm per month). In the long-term, the weather will be more variable from year to year, with fluctuations in monthly temperature jumping from around 1°C (2020–2030) to over 3°C (2080–2090) (see Figure 1). This is likely to lead to a higher prevalence of both flash flooding and drought.

**The country's land is becoming less productive – at a time of rapid population growth and urbanisation. By 2040, food consumption is expected to outrun production by 20 million metric tonnes.**

While climate change is hastening land degradation in Kenya, the situation has been exacerbated by unsustainable agricultural practices (e.g. overgrazing, repeated acidic fertiliser use, bush burning and charcoal manufacture) and urbanisation taking place without adequate investment in infrastructure (e.g. drainage).<sup>9</sup> Over decades, the net result has been a reduction in fertile land and a loss of agricultural productivity across Kenya, with the situation set to worsen in the years to come (see Figure 2). Indeed, in a 2019 study looking at soil acidity across the country, Kenya Markets Trust found land degradation in the 80s and 90s resulted in agricultural productivity losses of some 40% in recent years.<sup>10</sup> Using more recent data, the World Bank (2019a) found that "Kenya's agriculture total factor productivity growth over 2006–2015 lagged Rwanda, Ethiopia and Tanzania and was well below levels attained by countries in South Asia and East Asia."<sup>11</sup>

Figure 1

Projected Change in Monthly Temperature in Kenya, 2020–2030 (Top) and 2080–2090 (Bottom)



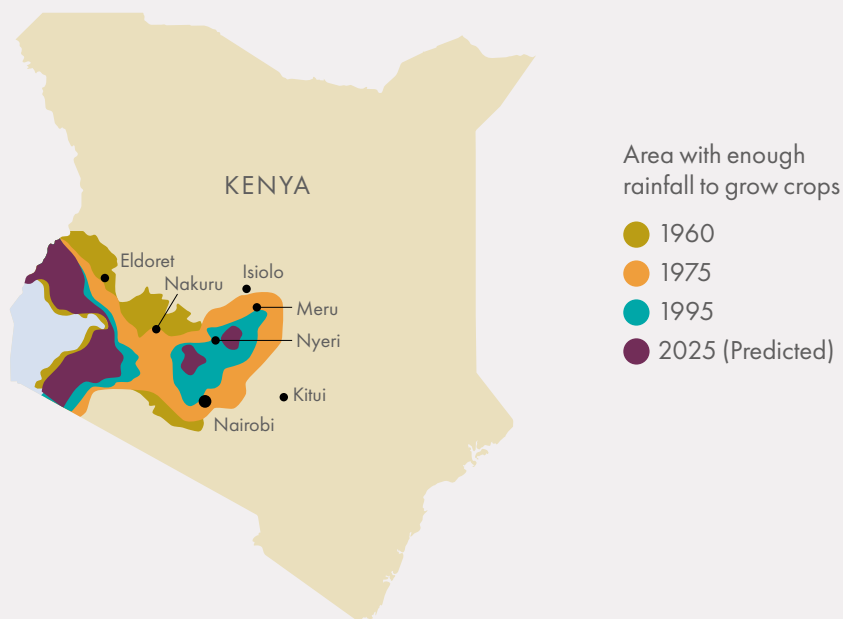
Source: World Bank (2020b)

In Kenya, soil conservation is a major issue with clear implications for food security. An assessment of soil acidity undertaken by Kenya Markets Trust found that “as a result of acidity, farmers experience low crop response to fertilisers and hence low crop yields (...) Maize yields grown in these acidic areas has been documented to be as low as one ton per hectare, way below the potential of six tons per hectare.” Indeed, the Ministry of Agriculture estimates that around half of the smallholders in western Kenya may be farming soils with a pH below 5.5 (for many crops the optimum soil pH is 5.5 to 6.5).<sup>12</sup> The causes are a lack of crop rotation and the repeated application of DAP or urea fertilisers.

A study by the International Food Policy Research Institute (IFPRI) calculated the macroeconomic cost of environmental degradation in Kenya.<sup>13</sup> The report finds that the annual cost of land degradation was \$1.3 billion between 2001 and 2009. The IFPRI breaks down the economic loss, revealing how rangeland degradation costs \$80 million a year (in lost milk and meat production) and how nutrient deficient soils cost \$270 million a year (in lost wheat, maize and rice yields). These sums are much greater than previous estimates: in 2010, the IMF believed the annual cost of land degradation was just 3% of the country’s GDP (\$390 million).<sup>14</sup> This indicates that the trend is worsening.

Figure 2

## Observed & Projected Shrinking of Productive Crop Areas in Kenya, 1960–2039



Source: Nyaoro, Dulo (2016: 63)

The environment is presenting challenges at a time when food demand is set to dramatically increase, in line with Kenya's rapid demographic growth and urbanisation (the population is expected to double by 2050, with 29 million additional people living in cities).<sup>15</sup> According to the UN's Food and Agriculture Organisation (FAO) (2019a), demand for livestock like cattle and chicken is set to rise by 94% and 375% respectively over the next three decades.

Since the 1990s, food consumption has outpaced production in Kenya and the supply gap remains a pressing issue (see Figure 3 for a view of the food deficit in 2018/19). While 11% of Kenya's current food needs are covered by imports, this could rise to 25% by 2040, when annual consumption is projected to outrun production by nearly 20 million metric tonnes.<sup>16</sup> The supply deficit is resulting in a volatile market for food staples: in 2017, maize prices fluctuated by more than 45%.<sup>17</sup> This volatility is set to continue, leaving Kenyans vulnerable to price hikes and placing pressure on the country's reserves of foreign exchange.

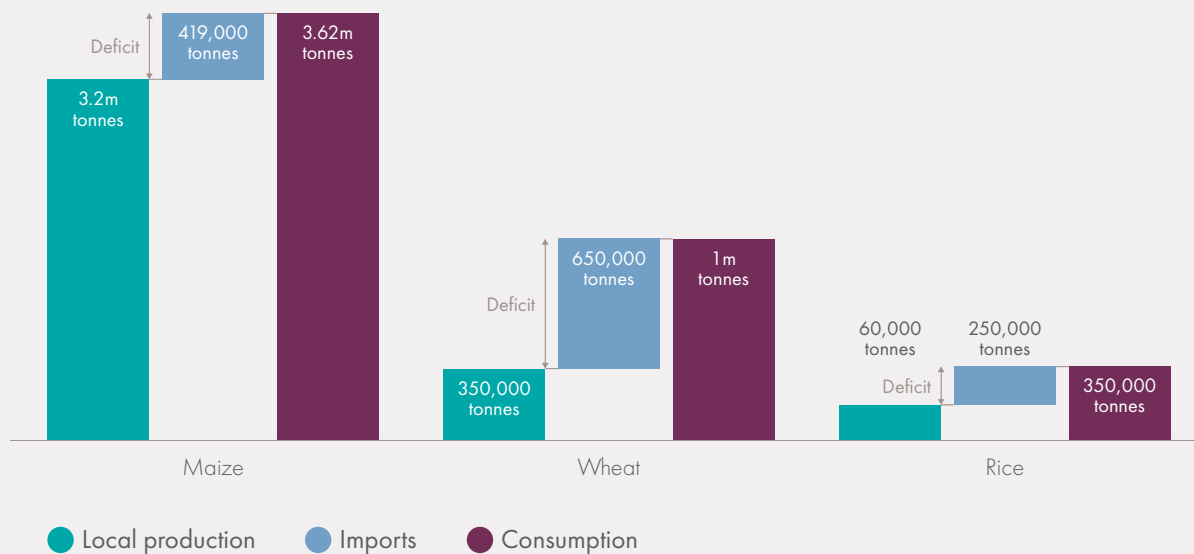
Given the likely continuation of rapid population growth and if rapid urbanisation is left unmanaged, these structural forces risk increasing pressure on land that is already stressed, which may lead to greater food insecurity and conflict.<sup>18</sup>

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Figure 3

### The Food Supply Deficit for Key Staples in Kenya, 2019

Note: Figures do not include informal trade



Source: USDA Foreign Agricultural Service & Sofala Partners

### There are growing tensions over land and water.

According to an article published by Reuters, population growth and land degradation in Kenya have fuelled intense competition over resources in recent years. In addition, climate change is set to worsen communal tensions, as erratic weather patterns undermine agricultural livelihoods. Indeed, as rural communities seek to sustain themselves and meet the country's food needs, croplands are being expanded, taking in previously marginal areas, pastureland, forests and steep slopes. As grazing areas and water holes disappear, pastoralists are adapting their routes, venturing into semi-arid areas and forests. Driven by the growing scarcity of resources, these new patterns of behaviour are generating friction between communities in rural areas.

Ngai Mutuoboro, Chairman of Atiriri Bururi ma Chuka (a conservation group), provides the example of the Chuka and Tharaka, groups who peacefully shared the Naka River until a decade ago. Owing to increasingly unpredictable rainfall in the area, Chuka farmers have been unable to use the river for small-scale irrigation and have come into conflict with Tharaka pastoralists, who in times of drought have ventured further upstream in search of water for their livestock.

As a further example, a report by the UN Environment Programme (2019) found tensions in the Tana Delta were rising, as villages "bear the brunt of the delta's advancing degradation" and are "caught between deforestation, increasing drought and pastoralists desperate to feed their cattle." In 2012, 286 people died in resource-related clashes between farmers and pastoralists. A local villager summarises the deteriorating situation as follows: "when I was younger, we had a full month of rain and the pastoralists moved away. Now [the rain] lasts a week and everyone leaves their cattle here (...). The villagers collect dry wood, but the loggers take living trees. And where there are no trees, the sudden rain sweeps everything away." While violent conflict over land in Kenya has not reached the same scale or intensity as elsewhere in the Horn of Africa, this trend is of growing concern.



## Snapshot: Might reforestation address the issue of water scarcity in Kenya?

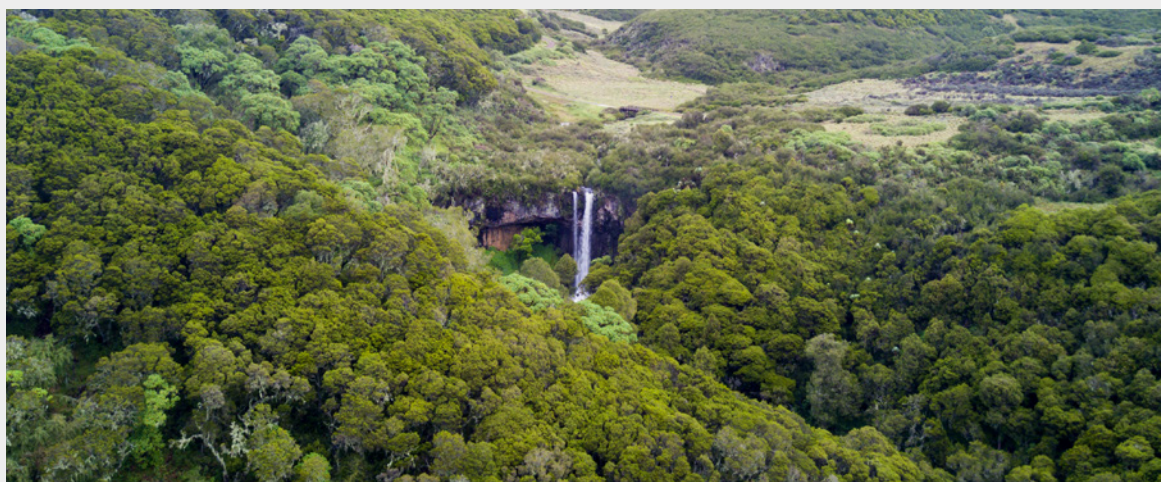
Most of Kenya's water supply originates from five water towers: the Mau forest complex, the Aberdare range, Mount Kenya, Mount Elgon and the Cherengani Hills. These are the largest montane forests and form the upper catchments of the country's main rivers.

Over the past 25 years, the destruction of forests has been extensive, owing to the establishment of settlements without due process, illegal logging and unsustainable grazing. According to a government taskforce set up to investigate forest management and logging, the country's forest cover has been shrinking at a rate of 5,000 hectares per year.<sup>24</sup> While the constitution stipulates Kenya must maintain a minimum forest cover of 10%, coverage fell to 7.4% in 2019.<sup>25</sup> Importantly, closed canopy forest cover – which is essential for water resources – was just 2% in 2018, a proportion far below the continental average (9.3%) and world average (21.4%).<sup>26</sup> With implications for key agricultural sectors (including tea and maize), deforestation is diminishing water availability in the country and affecting the rural economy, with 62 million cubic meters of water and \$19 million lost each year.<sup>27</sup> According to an impact report from Kenya's water regulator WASREB, "If the business-as-usual approach is maintained in the way water resources are managed, Kenyans will face a 30% gap between available freshwater supply and demand by the year 2030."<sup>28</sup>

Recently, the government has made a concerted effort to reclaim water catchment areas and reverse deforestation, recognising how the loss of forest cover has the potential to derail the country's development. In response to the taskforce's findings and recommendations, the government set out a "National Strategy" in 2019, clarifying how the country will achieve and sustain 10%+ tree cover by 2022.<sup>29</sup> In addition, the government has committed to restoring 5.1 million hectares of degraded and deforested land by 2030 as part of Kenya's contribution to the African Forest and Landscape Restoration Initiative (a continental project designed to inspire the restoration of 100 million hectares of land).<sup>30</sup>

In the short-term, the government's ambitions in forestry may be limited by a lack of finance and planting material. Indeed, the government has estimated that realising 10% tree coverage will cost around \$430 million and rely on a mixture of public and private resources, much of which is yet to materialise.<sup>31</sup> In addition, the government is yet to establish a sustainable supply of high-quality tree seedlings (c. 1.8 billion are required to meet the re-forestation target).<sup>32</sup>

However, in the long-term, growing public pressure is expected to drive regeneration initiatives forward. According to Kaluki Paul Mutuku, a regional coordinator for Youth4Nature, "2019 [saw] the rise of a global youth movement for climate action on a scale never seen before and this movement has spread to Africa. The scale, energy and momentum of this movement creates new opportunities that simply didn't exist before."<sup>33</sup>



*A mountain waterfall in Aberdares National Park, Kenya*

# Owing to increasing public pressure, efforts to mitigate climate change and conserve land will intensify.

## Signalling a commitment to change, the government has enacted important environmental legislation in recent years, such as the plastic bag ban in 2017 and the National Climate Change Action Plan 2018–2022.

The current administration has instituted a number of climate change and sustainable agriculture policies, including the National Climate Change Action Plan 2018–2022 and, in 2020, an updated Individually Determined National Contribution (INDC) that proposes even more ambitious cuts on the greenhouse gases.<sup>34</sup> Broadly speaking, this set of regulations aims to prevent land degradation and address food insecurity by mitigating the effects of climate change and incentivising sustainable growth. While the implementation of these policies has been plagued by challenges (e.g. weak inter-ministerial coordination and competition between central government and counties), there have been a few notable success stories.

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IN 2019, THE GOVERNMENT REPORTED THAT 80% OF THE POPULATION HAVE STOPPED USING PLASTIC BAGS.

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For example, 2017's plastic bag ban made the manufacture, sale and use of plastic carrier bags illegal. The use of a bag can result in a \$500 fine or jail time, anyone found producing, importing or selling plastic bags can be fined up to \$40,000 or face a four-year prison sentence.<sup>35</sup> Following the launch of the policy, the government acted nimbly, temporarily outlawing the manufacture of environmentally damaging polypropylene bags, which increased as a result of the ban. In 2019, the government reported that 80% of the population have stopped using plastic bags.<sup>36</sup>

Other initiatives are expected to deliver benefits over time. As Abraham Muthogo, CEO of Miradi Capital, highlighted, "Kenya has recently put in measures to address climate change that will bear fruits in the medium to long-term, including the reclamation of water towers, a logging ban and aggressive reforestation." Mohammed Nyaoga, Board Chairman at the Central Bank of Kenya, took heart from the incremental progress being realised by social activists across the country: "I think we will get the country green again. I say this because the grassroots are mobilising. For example, communities living along the new road in Nairobi from ABC Place towards Kitisuru sought permission from the Kenya National Highways Authority to plant trees along the road. This was not driven by government, just individuals deciding to act."

Despite these optimistic assessments, the implementation of necessary environmental reforms in politically sensitive areas will prove challenging. The matter of increasing land tenure security in Kenya, which is "pivotal" for the adoption of soil and water conservation measures, according to the UN Convention to Combat Desertification (2019), offers a case in point. While the government has attempted "to establish a firm legal framework for regularising tenure security in informal settlements" and has embarked on large multi donor-funded programmes, the issue is unlikely to be fully resolved even in the medium- and long-term, owing to its complexity and political dimension.<sup>37</sup>



*Windmills at the Ngong Hills wind farm in Ngong, Kenya*

**Stronger and more concerted action is necessary, but there are reasons to be optimistic that change is possible in the short-term (due to grassroots activism), medium-term (due to the use of climate-smart tech) and long-term (due to greater regional & global collaboration)**

“THE CORRECT POLICIES FOR CLIMATE CHANGE HAVE TO BE DRIVEN BY THE POPULATION MAKING THE RIGHT DEMANDS OF GOVERNMENT.”

Kennedy Odede, Co-founder of Shining Hope for Communities

#### **Short-term (1–2 years)**

*The growth of grassroots activism:* Gauri Vidyarth, a Financial Advisor at VFS International, felt hopeful about the successful delivery of an environmentally friendly agenda owing to the support of young people: “the plastic bag ban shows when we get serious about an agenda, we can deliver on it.”<sup>38</sup>

*The expansion of renewable energy:* Kennedy Odede reflected that “in the village they use charcoal because it’s affordable – we need to offer alternative affordable green solutions.”<sup>39</sup> Increasingly, start-ups are trying to tackle the use of environmentally damaging fuel (e.g. KOKO Networks – launched in early 2019 – is now widely distributing ethanol as a comparatively clean and safe alternative for home cooking)<sup>40</sup> Kenya’s energy sector is emerging as a global leader in terms of transitioning from non-renewable to renewable energy sources.<sup>41</sup> With the launch of Africa’s largest wind power farm in 2019 (the 310 MW Lake Turkana Wind Power Project) and new geothermal, hydropower and solar plants coming online soon, Kenya is expected to reach its ambitious goal of generating 100% of its power from renewable sources in the medium-term.

#### **Medium-term (5 years)**

*The implementation of a long-term masterplan:* Abraham Muthogo, CEO of Miradi Capital, reflected on the need for “an environmental masterplan that runs for the next 10 years minimum with an annual review.”<sup>42</sup> Owing to public pressure and the pace of climate change, the country may adopt an all-encompassing and long-term approach over the medium-term.

*The widespread adoption of climate-smart technology:* Benson Ndeta, Chairman of Savannah Cement, was uncompromising as he asserted “the country must invest heavily in technology and innovation that will address water and food availability.”<sup>43</sup> While climate-smart technologies are starting to attract investment, George Nyabuga, a Professor at the University of Nairobi, claimed the process needs to be accelerated. Development finance institutions are likely to turbo-charge the process in the medium-term, by taking actions like the discontinuation of investment in all non-clean and non-renewable business models.<sup>44</sup> As an early signal of this emerging trend, the African Development Bank announced it will no longer finance coal projects in Africa at the end of 2019.<sup>45</sup>

#### **Long-term (10+ years)**

*A greater emphasis on regional and global collaboration:* Adopting the long view and appreciating the scale of the challenge, Jared Kangwana, a former member of the East Africa Legislative Assembly, outlined how “containing the ramifications and advance of climate change will require coordinated global effort – we cannot succeed on our own as a single nation or even as a region.”<sup>46</sup>

## Snapshot: off-grid renewable energy is set to scale in Kenya and represents a strong growth opportunity

Kenya's off-grid energy sector boasts an increasingly diverse set of products, ranging from solar lamps to energy systems capable of powering a small clinic and mini-grids that connect several hundred households. The sector is growing quickly: over the past decade, the use of products such as solar lanterns has risen from 2% of households to around 18%, enabling millions of people traditionally left off the grid to light their homes without the use of expensive and hazardous kerosene.<sup>47</sup> According to a World Economic Forum report, this strong growth is set to continue.<sup>48</sup>

In a recent development, large corporations have started to invest in off-grid energy, illustrating how the sector is increasingly viewed as having high development impact and commercial viability. In September 2019, the French utility firm ENGIE announced the acquisition of Mobisol, an off-grid provider with a footprint in Kenya, Tanzania and Rwanda.<sup>49</sup> Indeed, ENGIE already owns a solar home systems unit – Fenix International – which has a presence in six other markets in Africa, including Uganda. As large corporations continue to enter the sector, this will facilitate economies of scale, network effects and the attraction of financial, technical and human resources, which the World Bank (2019b) believes will be critical if Kenya is to undergo a digital transformation.<sup>50</sup>

However, while recent investments indicate the commercial potential of off-grid energy, it remains unclear whether or not the target demographic is able to pay for electricity. Anjali Saini, renewable energy consultant and former adviser to the renewable energy window of the African Enterprise Challenge Fund, emphasised how a strict focus on “the bottom of the pyramid” will not be a viable business strategy for some time (unless it is subsidised in some form), especially if cost of capital remains relatively high.<sup>51</sup>

It is worth noting how firms are innovating and evolving their business models in response to this market reality. For example, the pay-as-you-go off-grid energy platform M-KOPA has started to diversify its offer, selling solar-powered appliances like fridges alongside its core solar home solutions. For Saini, this strategic pivot towards SMEs would be more effective in conjunction with economic development packages: “linking electricity access to local business is a potential driver [of demand] as it [establishes] a tangible link between electricity access and income potential. However, the scale of that demand may in some cases still not be commercially viable without economic development packages.” The potential market is significant: a survey conducted by M-KOPA in collaboration with the UK's CDC found 73% of respondents would use a fridge in their business, recognising how the appliance would free up time for income-generating activities.<sup>52</sup>

Over the next five years, this young and dynamic sector will adopt a ‘test and learn’ approach, as firms determine the most sustainable product mix, last mile distribution model and way of managing non-payment risk. This will involve collaboration with the public sector, especially on regulatory issues surrounding consumer protection. In addition, as part of this evolution process, firms are set to start exploring how to link off-grid energy solutions with the local economy (e.g. cold storage facilities for the fishing industry).<sup>53</sup>

Over the next five to ten years, successful market players – buoyed by the right enabling environment and boasting a mature set of products – will drive the demand necessary to realise scale. Firms like M-KOPA are expected to become diversified non-bank financial institutions with multi-channel customer relationships and a broad portfolio of products, generating demand among those groups traditionally excluded from the formal banking system.<sup>54</sup>



*Simple solar panels to harvest sunlight for electricity on the shores of Lake Victoria, Kenya*



*Dusty Kenyan plains during a severe drought*

## **PART B:**

# **IMPACT OF COVID-19 ON ENVIRONMENT IN KENYA**

## **Emerging amid extreme climate events, COVID-19 has stressed Kenya's food system.**

There is an emerging consensus that zoonoses such as COVID-19 will become more common as human activity continues to destroy the natural environment, forcing societies and animals to compete over increasingly scarce resources. While the Global Carbon Project estimated that global emissions would fall by 4–7% year-on-year in 2020, owing to movement restrictions, there appears to be little reason to believe the pandemic will serve as a watershed moment for climate action.<sup>55</sup> Indeed, in a report published mid-pandemic, the International Monetary Fund emphasised the critical need for Africa to “adapt” to climate change, which may cost some \$30–\$50 billion over the next decade (i.e. 2–3% of the continent's GDP).<sup>56</sup>

Across East Africa, the COVID-19 crisis coincided with extreme climate events and threatened to cause widespread food insecurity. As pandemic-related measures upended livelihoods and disrupted supply chains, the World Food Programme calculated the number of food insecure people in the region could increase by 34–43 million.<sup>57</sup> In Kenya, efforts to contain the outbreak of COVID-19 and aid communities were frustrated by extreme rainfall in March and April, which affected 233,000 people across 75% of the country's counties.<sup>58</sup> A product of a changing climate, the severe weather caused the Nzoia river to burst its banks (rendering 40,000 people homeless); resulted in fatal mudslides in West Pokot and Elgeyo Marakwet; and increased Lake Victoria's water level by two metres, impacting families in Kisumu (a situation last witnessed in the early 60s).

In addition to COVID-19 and extensive flooding, the region was affected by a dramatic upsurge of desert locusts in early 2020 – the worst experienced in Ethiopia and Somalia for 25 years and in Kenya for 70 years.<sup>59</sup> A significant threat to food security, even a modest swarm of desert locusts – c. 40 million – can consume as much vegetation as 35,000 people in a single day. Owing to the heavy rainfall and breakdown of pesticide supply chains amidst the pandemic, desert locusts enjoyed perfect breeding conditions and – according to Oxfam – placed millions of people in the region at risk of increased hunger and poverty.<sup>60</sup> Indeed, it is thought up to 70 000 hectares

of pastureland in Kenya was lost to the pest (as of June 2020).<sup>61</sup>

Since two-thirds of the countries in Africa are net importers of food, observers were quick to conclude that restrictions on global production and trade would lead to acute shortages on the continent.<sup>62</sup> In Kenya, a country with a long-standing food supply deficit, the outlook initially looked bleak: in May 2020, maize stocks dropped by 25%<sup>63</sup> and there were significant year-on-year price hikes for items such as onions, tomatoes and beans.<sup>64</sup> However, according to an editorial in *Business Daily*, the government effectively averted a serious food crisis by establishing a technology-enabled “War Room” for food security, which included decision-makers from across the public and private sectors and facilitated the real-time monitoring of stocks and prices.<sup>65</sup> In addition, Kenya received vital support from multilateral institutions: while the country's farming communities benefitted from the African Development Bank's \$7 billion continental package for agriculture, the World Bank advanced KSH 4.59 billion to support Kenya's fight against the desert locust invasion.<sup>66</sup> Drawing a line under the initial phase of the pandemic, the UN's Food and Agriculture Organisation (FAO) classed the food security situation in Kenya as “stable” in August 2020, recognising how the government had maintained access to international supply chains and successfully enabled domestic farming to continue.<sup>67</sup> However, the FAO remains concerned that Kenya's ability to feed itself in future will be challenged by population growth and the increasing frequency of extreme climate events.

In a promising move, the government has committed to using some of the World Bank's \$1 billion pandemic-related loan to set up an electronic voucher system for agricultural inputs, with the aim of enhancing the targeting of subsidies and thereby supporting low-income rural communities.<sup>68</sup> To ensure farmers adequately conserve the land and raise yields in the near future, such stimulus appears critical: a survey of 334 agro-dealers by Mercy Corps suggests 93% of such firms have been affected by the pandemic, as cash-strapped consumers spend 31–50% less per store visit.<sup>69</sup>



## PART C:

# CONCLUSION

## What might climate change mean for economic transformation?

**Export-oriented sectors are leading the way in driving higher environmental standards, but could benefit from further government commitment to a green agenda.**

While the local market does not pay a premium for or require much in the way of environmental standards, sectors with a large share of produce going to export markets, especially in Europe and the US are being driven increasingly to meet high environmental standards. These include cut flowers, horticulture, textiles, tea and coffee, which face industry pressures on land stewardship and deforestation concerns. Given Kenya's legislation, government capability, and the existing scale of these sectors compared to its regional competitors, developing mechanisms to raise, adopt and monitor environmental standards could be a major factor in helping Kenya to maintain or grow its exports in these sectors, paving the way for wider change.

Kenya has enacted a strong guiding policy in the Climate Change Act, with plans for a climate fund and a coordinating mechanism chaired by the President. As noted, Kenya has also signalled a commitment to enhancing its commitments to reduce its carbon output by submitting a revised INDC to the UNFCCC. The new INDC significantly raises Kenya's financial needs to fulfil its targets and thus we are likely to see more concerted efforts in the government fundraising efforts for climate action. To date, however, data is currently extremely limited, hindering the monitoring of progress. Understanding the efficacy of adaptation practices across Kenya's agricultural sectors could be a first start at understanding the scale of the challenge and any progress being made. As Edward Mungai, Executive Director of the Kenya Climate Innovation Centre (KCIC), noted, "We have strong plans in place, but these need to be guided towards the evidence of what's working when being implemented."



*A farmer practices agroforestry to be climate change resilient*



*A drip irrigation system in an agricultural training centre, Kenya*

## **Concerted focus on the water sector is needed, and in particular a shift towards widespread irrigation schemes to protect agriculture from climate volatility.**

Water is going to be a massive issue for Kenya within the next 10 years, with dependence on rainfall a particular problem. This will have major economic consequences. According to one estimate from the World Health Organisation, if Kenya could decouple its economy from rainfall variability it would increase annual GDP growth by 2.4%.<sup>70</sup> Irrigation seems to be an area that could benefit from greater focus, as we have seen the recent failure of large-scale schemes, such as Galana, as well as limited access to small-scale irrigation. Progress is being made on urban and rural water services, with concerted efforts by government and various stakeholders to improve household water access. For example, access to water increased from 39% to 60% between 2006 and 2020 as a result of institutional reforms and sector improvements. However, further efforts need to be put into irrigation schemes in particular, especially those with the potential to scale amongst rurally dispersed smallholder farmers. As Edward Mungai put it, “We are seeing positive developments, but we need to find a few copy-paste models of irrigation schemes that can be scaled up.” Without substantial progress in this area, any efforts to tackle soil degradation and try to raise productivity may well be rendered ineffective by climate change.

## **The transformation of Kenya’s agricultural sector will nonetheless need more than irrigation.**

While irrigation will be crucial to Kenya’s ability to mitigate the increasing climate risks of droughts, which will enable growth of the agriculture sector, much greater efforts are also needed to secure effective knowledge and access to quality inputs, services and technologies. The use of agricultural lime, crop and soil specific fertilisers, conservation farming techniques, as well as improved seeds and other inputs will be critical factors in intensifying land use and raising productivity in a sustainable manner. Similarly for livestock and aquaculture, effective environmental management of rangelands and water resources is going to be critical to preserve conditions for fish farming and pastoralism. This is a challenging agenda, with substantial systemic and cultural constraints. Stronger, more coordinated efforts are needed to secure sustainable and transformative change.

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## **Full interviewee list**

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Adaptation to Climate Technologies, The Africa  
Enterprise Challenge Fund

Benson Ndeta, Chairman, Savanna Cement

Edward Mungai, Executive Director, Kenya Climate  
Innovation Centre (KCIC)

Gauri Vidyarthi, Financial Advisor, VFS International Ltd

Professor George Nyabuga, Dep. Journalism Nairobi  
University, Professor

Jared Kangwana, Former Member, East Africa  
Legislative Assembly

Kennedy Odede, Co-founder, Shining Hope for  
Communities

Mohammed Nyaoga, Board Chairman,  
Central Bank of Kenya

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**Msingi** is a forward-thinking East African organisation focused on catalysing competitive industries of the future. Taking a regional approach to sectoral development, Msingi works across Kenya, Rwanda, Tanzania and Uganda. Msingi is currently working in the aquaculture and textiles & apparel sectors. Msingi aims to generate new jobs and boost incomes while fostering inclusive opportunities for future generations to improve their livelihoods. Msingi's systems model blends market facilitation tools with the ability to directly finance pioneering, strategically-important entrepreneurs. The aim is to enable industries to remain competitive in the long-term, protected against risk, and capable of developing new products and services.

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**Kenya Markets Trust (KMT)** is a Kenyan not-for-profit organisation that specialises in market transformation. KMT works to stimulate inclusive and resilient growth that will lead to a step-change in the livelihoods of millions of Kenyans. KMT takes a long-term approach, staying true to its mission while adapting to the forces – such as climate change and emerging technologies – that are shaping the markets it operates within. Since 2012, KMT has created 230,000 new jobs and £165m additional income for Kenyans. The current portfolio comprises work in agricultural inputs, water and livestock.

[www.kenyamarkets.org](http://www.kenyamarkets.org) | [info@kenyamarkets.org](mailto:info@kenyamarkets.org)



**Gatsby Africa** has worked to create jobs, raise incomes and build opportunities for people in Africa since 1985. Gatsby's mission is to accelerate inclusive and resilient economic growth in East Africa. Gatsby aims to achieve this by demonstrating how key sectors – such as commercial forestry in Tanzania – can be transformed. Gatsby funds and implements programmes that look to catalyse and influence large-scale and lasting change in priority sectors. Gatsby also builds and supports local organisations dedicated to sector transformation, while aiming to share learning with others – such as governments and donors – who are trying to catalyse economic growth.

[www.gatsby.org.uk/africa](http://www.gatsby.org.uk/africa) | [learning@gatsbyafrica.org.uk](mailto:learning@gatsbyafrica.org.uk)

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We are eager to hear from others to discuss the findings of this report, deepen our understanding, and help target our future research.

To get in touch and to keep up-to-date with Horizon's activities, please connect with us online:

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