



GLOBAL  
CENTER ON  
ADAPTATION



**May 2020**

# **INTEGRATED RESPONSES TO BUILDING CLIMATE AND PANDEMIC RESILIENCE IN AFRICA**

**A Policy Brief from the  
Global Center on Adaptation &  
African Adaptation Initiative**

# CONTENTS

Summary .....	3
The Anatomy Of A Compound Crisis .....	6
Building Back Better - A “Triple Dividend” Response .....	7
Cross Cutting Initiatives To Expand Collective And Locally-Led Action .....	11
A More Resilient Future For Africa: Actions To Secure A Triple Dividend .....	13
References .....	14

# SUMMARY

The COVID-19 pandemic is the biggest challenge the world has faced since the Second World War. While it began as a health crisis, it has far reaching economic ramifications. For Africa the pandemic's impacts will be particularly severe – by exacting a heavy human toll, upending livelihoods and damaging business and government balance sheets, the crisis threatens to slow down the region's growth prospects for years to come. According to the World Bank the pandemic has set off the first recession in the Sub-Saharan Africa region in 25 years.<sup>1</sup>

At the same time, the COVID-19 crisis is colliding with the continent's existing climate crisis. Changes in precipitation levels, increase in temperature extremes and rising sea levels are already having a wide range of direct and indirect impacts on Africa and it's the poorest and most vulnerable who are suffering the most. The pandemic has already hit communities reeling from the worst locust outbreak in 70 years, record high water levels in Lake Victoria and floods in the Democratic Republic of Congo - a combination of disasters all linked to climate change<sup>2</sup>.

Across the continent, leaders in the public, private, and development sectors are taking decisive action—both to save lives and to protect households, businesses, and national economies. There is the risk that misguided allocation of the stimulus and recovery spending could lead to stranded assets, vulnerable populations and irreversible damage to natural assets such as the healthy ecosystems and watersheds upon which the livelihoods of so many ultimately depend. The African Development

*“If the virus is a shared global challenge, so too should be the need to build resilience against future shocks. Emerging and developing countries are the least prepared for the arrival of Covid-19, just as they are most vulnerable to the effects of climate change.”*

**Ban Ki-moon**, 8th Secretary-General of the United Nations

Bank Group has created a \$10 billion COVID-19 Response Facility to address the crisis<sup>3</sup>. In addition, at the time of writing this brief, several African countries have already moved to stabilize fiscal pressures through cancelling, postponing, and redirecting all non-essential expenses. But the risk is these short-term emergency measures may unintentionally damage ongoing climate adaptation measures across the highly climate-exposed sectors of food security; water; and infrastructure.

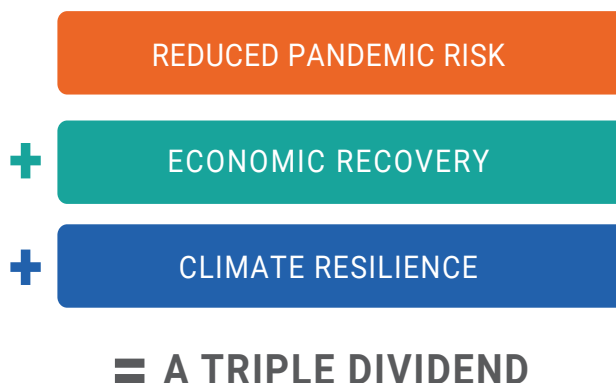
The international community has also moved swiftly to support African countries in responding to the COVID-19 crisis but the \$57 billion<sup>4</sup> announced so far for 2020 is not enough to offset the estimated over \$100 billion that African countries will need immediately to respond to this crisis and finance a health and social safety net response<sup>5</sup>, let alone make up for expected losses in GDP that may approach an estimated \$300 billion over 2020-2021 alone<sup>6,7</sup>. Meanwhile Africa continues to face the same challenges it has always done including our climate emergency. There must be an integrated response to both crises so recovery programmes can propel Africa towards increased resilience.

This policy brief has been prepared by the Global Center on Adaptation (GCA) and the African Adaptation Initiative (AAI). We recommend focusing stimulus investment on resilient infrastructure and food security to overcome the COVID-climate crisis. We propose a set of policy recommendations that bring multiple benefits, a “triple dividend”, to African countries. The first dividend is reduced pandemic risk. The second is climate resilience and the third is strengthened economic recovery. Many adaptation actions also generate

significant additional economic, societal and environmental benefits which accrue on an ongoing basis starting at the time of investment and are not dependent on the future state of the climate.

These recommendations must be underpinned by multiple stakeholders, including multilateral development banks, working together to effectively mobilize multiple sources of finance, prepare and implement knowledge acceleration programs and project preparation tools to increase capacity for more rapid project cycles. In addition, all proposed interventions should make citizens instrumental to the response. This can be achieved through consultations, co-creation and implementation to build on the increased awareness of the value of the social capital of communities and grassroots organizations.

#### INVESTING IN ADAPTATION YIELDS



Source: Adapted from ODI, GFDRR, and the World Bank.

*“The real impact of the coronavirus crisis on climate will ultimately depend on the choices we make in how we recover. Meeting the Paris Agreement’s goals for mitigation and adaptation must be central to this effort to ensure we reduce the likelihood of future pandemics”*

**Ali Bongo Ondimba**, President of Gabon and African Union Champion of the African Adaptation Initiative

## ACCELERATING ADAPTATION IN KEY SYSTEMS FOR CLIMATE AND PANDEMIC RESILIENCE

Our priority policy recommendations apply resilience actions to three key systems affected by both the pandemic and climate change in Africa: systems that produce food, protect and manage water and plan and build infrastructure. These systems must be underpinned by action to ensure collective and locally-led action for decision making and innovative financing mechanism for a more resilient future.



### Ensure food security and strengthen the agricultural value chain

Today 74% of Africa’s population is deemed food insecure, and COVID-19 will further exacerbate the situation through reduced regional agricultural production<sup>8</sup>. Moreover, 80% of Africa’s agricultural production relies on smallholder farmers<sup>9</sup>. Their productivity is among the world’s lowest, capped at 30% of their potential due to lack of financing and market integration. To feed their rapidly increasing populations, sub-Saharan African countries thus have to rely on massive food imports, projected before the onset of the pandemic to grow from USD 35 billion (2017) to USD 110 billion (2030)<sup>10</sup>. This pandemic crisis could create a severe food security crisis in Africa<sup>11</sup>.

In order to prevent a major food crisis in Africa resulting from COVID-19, a priority action is to secure and strengthen the food supply for vulnerable populations; to strengthen Africa’s smallholder farmers through a proactive gender approach comprising the 40% female smallholder farmers ; and to support transactions between agricultural value chain stakeholders to improve farming techniques and enable the purchase of smallholders’ production for commercialization on the market. These efforts would be supported by digital advisory services. This will both raise incomes and employment opportunities and support the food security objectives of the region<sup>12</sup>.



### Increase access to water and sanitation for increased resilience

A continuing shortfall in water infrastructure investments has left billions exposed to the COVID-19 pandemic and will make the climate crisis worse in both the short and long-term as climate change affects the availability, quality and quantity of water needed for basic human needs. In Africa more than 320 million people are without access to safely managed drinking water, and over half the population are without access to any sanitation, at a time when we are all being encouraged to wash our hands frequently to prevent the spread of Covid-19<sup>13</sup>. 115 people in Africa die every hour from diseases linked to poor sanitation, poor hygiene and contaminated water and it costs Sub-Saharan African countries more in lost GDP than the entire continent gets in development aid<sup>14</sup>.

Climate water resilience in Africa needs to be integrated at the basin, city and utility level to ensure adaptation actions for water systems integrate with other urban services and are effective. Water utilities and service providers, in particular, need to have sustainable and resilient water resources management to ensure continuity of water supply and to deliver safe and secure water.<sup>15</sup>

A priority policy intervention is to boost access to water and sanitation in parallel with efforts to improve water governance across sectors and countries in the continent. This requires measures to promote investment and solutions that encompass management of 'natural infrastructure'; optimize water management to support effective distribution and use of scarce water resources for multiple uses in human settlements, agriculture and industry; and support to enhanced water governance through improved cooperation frameworks within and across countries.

*“The world is about to deploy enormous, gigantic fiscal stimulus and we can do it in a way that we tackle both crises at the same time. If our world is to come out of this crisis more resilient, we must do everything in our power to make it a green recovery.”*

**Kristalina Georgieva**, Managing Director of the International Monetary Fund



### Invest in robust job creation through resilient infrastructure

To sustain Africa's growth, and speed up efforts to end extreme poverty, investment in resilient infrastructure is fundamental. Infrastructure resilience is about delivering services regardless of disruptive events that may occur. The COVID-19 pandemic has amplified calls for infrastructure to be resilient and adaptable so that it can effectively operate during moments of crisis. According to the World Bank, Africa needs about US\$100 billion a year for the next decade to fill its infrastructure gap<sup>16</sup>. Economically, the case for technologically advanced, resilient and sustainable infrastructure is clear. Low and middle-income countries alone could see a net benefit of \$4.2 trillion from investing in infrastructure that prioritizes future-focused resiliency. That's a \$4 return for every \$1 spent<sup>17</sup>. By contrast, investing in "business-as-usual" infrastructure not optimized for resilience only returns \$1.5 for every \$1 spent<sup>18</sup>.

A priority action must be scaling up resilient infrastructure to provide both the source and support for economic growth and job creation to remove barriers to adaptation and pandemic recovery.

Resilient infrastructure investments are both employment-intensive (creating for example an expected 500,000 extra jobs in Europe alone by 2050) and have a high return on investment, making them an important tool to overcome the current economic crisis while safeguarding livelihoods.<sup>19</sup>

# THE ANATOMY OF A COMPOUND CRISIS

**P**andemic outbreaks can be economically devastating for affected countries, overwhelming public finances and reversing hard-won development gains. The immediate economic disruption resulting from loss of life and suspended productivity can translate into lasting impediments to growth. In addition, the effects of climate change increase the inherent risk of pandemic outbreaks<sup>20</sup>.

According to **The 1.5 Health Report**, a synthesis of the health content of the Intergovernmental Panel on Climate Change (IPCC) special report on global warming of 1.5°C: "There is strong evidence that changing weather patterns associated with climate change are shifting the geographic range, seasonality, and intensity of transmission of climate-sensitive infectious diseases."<sup>21</sup>

Nowhere is this more evident than Africa where both pandemics and climate change are threat multipliers because of their ability to aggravate existing tensions and problems and cause far reaching impacts. During a time of pandemic, climatic events place extreme pressure on water and food supplies as crops fail, on health systems as people fall ill and on the economy as response measures restrict the movement of people and goods. The 2016 Ebola outbreak in West Africa killed more than 11,000 people directly, but knock-on effects, such as diverting medical resources away from other conditions and the economic impact of lockdowns, killed thousands more<sup>22</sup>.

Africa is ill-prepared for the shocks resulting from increased pandemic and climate risk due to existing vulnerabilities which include extreme poverty, inadequate infrastructure and ongoing climatic pressures.

## Africa is ill prepared for shocks

Economic shocks caused by the pandemic and climatic events are particularly damaging for Africa because of a number of key underlying factors:

- **Pervasive poverty:** already home to 70% of the world's poorest people, the COVID crisis is expected to drive another 22.6 million people into extreme poverty<sup>23</sup>.
- **Limited fiscal capacity:** The ratio of public revenues to GDP in African countries averages just 19 percent giving African governments limited scope for stimulus packages compared to their peers in other regions<sup>24</sup>.
- **Extreme commodity exposure:** more than two thirds of Africa's economies earn over 80% of their export revenues from commodities, while prices for many key traded goods have fallen as demand has dried up during the COVID crisis<sup>25</sup>.
- **Fragile informal economy:** informal employment exceeds 85% of all jobs in Africa and is expected to be harder hit than the 30 to 35 million formal jobs currently at risk of reductions in wage and working hours<sup>26</sup>.
- **Remittances reliance:** accounting for over half of private capital flows to Africa and around 3% of its GDP, remittances are important for household income and are expected to fall by over 23% in Sub-Saharan Africa in 2020<sup>27</sup>.

Investment needs to be prioritized but this spending must contribute to long term resilience, and in particular resilience to climate change which is already a pressing problem. Our policy recommendations help address vulnerabilities to ensure Africa can rebound from the COVID-19 crisis stronger and more prepared to deal with future shocks while remaining on track to achieve the 2030 Sustainable Development Goals.

# BUILDING BACK BETTER - A “TRIPLE DIVIDEND” RESPONSE

For most African countries that were already facing major social, health and economic challenges, COVID-19 is severely testing their resilience. The World Bank estimates Sub-Saharan Africa could suffer a drop in GDP from 2.4% growth in 2019 to -2.1 to -5.1% for 2020, triggering its first recession in over 25 years<sup>28</sup>. So far, official creditors have mobilized around \$57 billion of COVID-19 stimulus in 2020 including upwards of \$18 billion from the IMF and the World Bank<sup>29</sup> and is being deployed across Africa but this amount is insufficient to offset the projected GDP decline that Africa is expected to suffer<sup>30</sup>. It is imperative that these and future financial resources are deployed to support the most vulnerable and build a resilient future for a continent on the frontline of our climate emergency.

Coordinated interventions across multiple sectors are required. Drawing on countries’ existing responses to the pandemic and on unique traits and issues typical to Sub-Saharan Africa, the Global Center on Adaptation and African Adaptation Initiative analyzed the fundamentals underpinning the unique and compound climate-COVID crisis emerging in Africa. Based on this, we suggest a set of “triple dividend” policy recommendations to avoid further economic losses, reduce future risks, and deliver additional social and environmental benefits<sup>31</sup>.

The policy recommendations allow African countries to deploy COVID-19 responses in a way that will enable the countries to continue to make progress on adaptation measures that are badly needed to secure Africa’s resilient future. They also serve as action framework for governments, Africa’s development partners and the private sector to act and adapt on multiple fronts.

## THE THREE “TRIPLE DIVIDEND” POLICY PRIORITIES

The GCA and AAI identified three “triple dividend” policy priorities to ensure that African countries are able to address COVID-19 and climate risks while meeting the basic needs of vulnerable populations and strengthening their economies.

### Ensure food security and strengthen the agricultural value chain

COVID-19 is set to radically exacerbate food insecurity in Africa. Regional agricultural production is expected to be reduced by 2-7% this year as lockdown measures have disrupted internal supply chains halting food production<sup>32</sup>. Huge locust swarms have devastated crops in Eastern Africa making the continent even more dependent on externally sourced food. As a net food importer, Africa is exposed to adverse international commodity price movements at a time when countries are reducing exports. Meanwhile Africa continues to face the same challenges it has always done – from climate shocks threatening food supplies to a continent emerging from its worse drought in years.

Food security is foremost among the immediate impacts to the population in times of economic crisis. Extreme weather effects, such as the 2016 Southern Africa drought caused crop losses of 60-75% in worst affected regions and placed 14 million people in need of emergency food aid. According to the World Food Programme, without action acute hunger is set to double due to COVID-19, independent of any major climate shocks to agriculture during the pandemic period. Climate factors risk local crop yields with resulting malnutrition increasing all-cause mortality by as much as 5-11 times among children.

The already 74% of people across Africa who are food insecure are expected to grow as COVID-19 impacts reduce regional agricultural production, notwithstanding potential additional climate shocks<sup>33</sup>. Moreover, as a net food importer, Africa relies heavily on global markets for foodstuffs, exposing the region to adverse international commodity price movements for staple foods affected by external trade bans since the onset of COVID-19<sup>34</sup>. Women comprise approximately 40% of Africa’s smallholder farmers which comprise the majority of the region’s food security value chain<sup>35</sup>.

Strengthening the value chain and increased productivity in nutritious foods is a priority action. Good examples of private and public sector interventions exist. The policy priority is to expand the scale of these interventions through large scale project design and wholesale finance.

### **Increase access to water for health, resilience, and growth**

Safe drinking water, handwashing and soap has been identified as one of the key defenses against COVID-19. Safely managing water and sanitation services reduces both pandemic transmission risk and transmission risk of climate-sensitive disease, in particular food and water borne diseases, for example, cholera.

African countries' ability to implement these measures are limited by the low level of access to basic water and sanitation across the region. Due to unprecedented urbanization and climate-change induced water scarcity, Africa is facing increasing shortcomings, with 42% of people being without basic water supply, and 72% without basic sanitation.<sup>40</sup> As WASH provision strongly decreases risks of diarrhea, malnutrition and acute respiratory infections, it is a vital precondition for tackling Africa's underlying vulnerabilities and creating resilient communities.<sup>41</sup> Clean water specifically assists communities to manage extreme water scarcity triggered through severe drought and salt contamination of water supplies due to sea level rise and coastal erosion.

Climate water resilience in Africa needs to be integrated at the basin, city and utility level to ensure adaptation actions for water systems integrate with other urban services and are effective. Water utilities and service providers, in particular, need to have sustainable and resilient water resources management to ensure continuity of water supply and to deliver safe and secure water.<sup>42</sup>

Policy and investment interventions to improve access to clean water and sanitation must be a critical component of any stimulus package. This requires measures to increase access to clean water and sanitation; optimize water management to support effective distribution and use of scarce water resources for multiple uses in human settlements, agriculture and industry; and support to enhanced water governance through improved cooperation frameworks within and across countries.

## **Helping smallholder farmers manage risks from COVID-19 and climate shocks**

Africa Improved Foods was started two years ago in Rwanda. It purchases locally grown maize and other crops from more than 24,000 smallholder farmers – mostly women – at set prices that guarantee a predictable income for them. These crops are locally processed in a factory in Kigali, where a nutritious “super cereal” is produced for mothers and young children in the region. An independent study commissioned by the IFC (International Finance Corporation of the World Bank Group) and conducted by the University of Chicago estimates that from 2016 to 2031, AIF will generate \$756 million for the people of Rwanda<sup>36</sup>.

Digital solutions that bundle many different advisories are also key and have already shown effective in dealing with both the COVID-19 crisis and the climate crisis, while also stimulating farmers' general resilience.<sup>37</sup> They allow potentially millions to benefit from information and data that underpins rapid, flexible and effective responses to exogenous shocks.

## **Building digitally-enhanced advisory systems**

Econet's mobile farming platform, enables thousands of farmers to receive advice and financial services, hire equipment and get value chain information<sup>38</sup>. Esoko in Ghana has a similar platform that is now also used to inform farmers about COVID-19 responses<sup>39</sup>. Following this example and expanding and bundling digital advisory systems to include a variety of shocks, indicators and advisories, is an effective way to achieve the needed scale and progress towards holistic systems resilience.



### Invest in robust job creation through resilient infrastructure.

Africa's export receipts and trade balances are set to deteriorate amid a global recession, with regional fiscal deficits also projected to grow as revenues from commodities and tourism fall<sup>45</sup>. The pressure on public finances in African countries will be substantial at a time when governments are mobilizing significant new resources to mitigate the effects of the pandemic. The first African governments have already moved to cut non-essential spending which could directly or indirectly affect funding for climate action.<sup>46</sup>

The global economic downturn resulting from COVID-19 will have acute impacts in Africa with massive job losses. Africa was the second fastest growing tourist economy in the world, with tourism making up close to 9% of Africa's GDP<sup>47</sup>. The hard-hit decline in the global tourism sector will have a significant impact on Africa's jobs. In addition, remittances to Africa, accounting for over half of private capital flows to Africa and constituting 3% of its GDP, is anticipated to decline by over 23% in 2020. Within Africa, informal employment exceeds 85% of all jobs and is expected to be harder hit than the 30 to 35 million formal jobs currently at risk of reductions in wage and working hours<sup>48</sup>.

As it stands, African infrastructure investments are vulnerable to climate change and COVID responses and stimulus funds are not yet programmed to address these vulnerabilities. Responses that are not optimized for resilience could lead to a deepening of the economic, health, food and water-related shocks, and slow Africa's crisis recovery.

At the end of March 2020, the African Ministers of Finance called for the urgent release of the \$ 100 billion of which \$ 44 billion towards debt relief for all African countries. The Ministers also suggested that if the crisis were to continue, an additional \$50 billion may be needed for the building back process in 2021.<sup>49</sup>

In addition, to these funding commitments so far, we estimate that \$100 billion investments<sup>50</sup> in resilient infrastructure would be needed to compensate by the end of the 2020s for the expected almost \$300 billion COVID-related GDP losses and foregone growth over 2020-21, while setting the stage for further economic growth and better equipping the continent to withstand climate and pandemic risks for decades to come. By optimizing responses to COVID-19 in Africa to also strengthen climate resilience, the return on resources deployed is increased by 2.5 times.

Scaling up resilient infrastructure can provide both the source and support for economic growth and job creation, removing barriers to adaptation and pandemic recovery. Currently, less than one-third of healthcare facilities have access to reliable electricity in parts of sub-Saharan Africa.<sup>51</sup> Unreliable infrastructure also acts as a brake on economic recovery, costing businesses \$300 billion per year in low- and middle-income countries and creating the jobs crucial to economic revitalization.<sup>52</sup> In Africa, an extra \$55 billion of investment is needed per year by 2025 to meet infrastructure needs.<sup>53</sup> There is also a need to invest better: applying climate data to prioritize interventions in the most exposed areas will reduce the additional costs of building resilience by 90% compared to an untargeted approach.<sup>54</sup>

### Accelerating Water and Sanitation for All

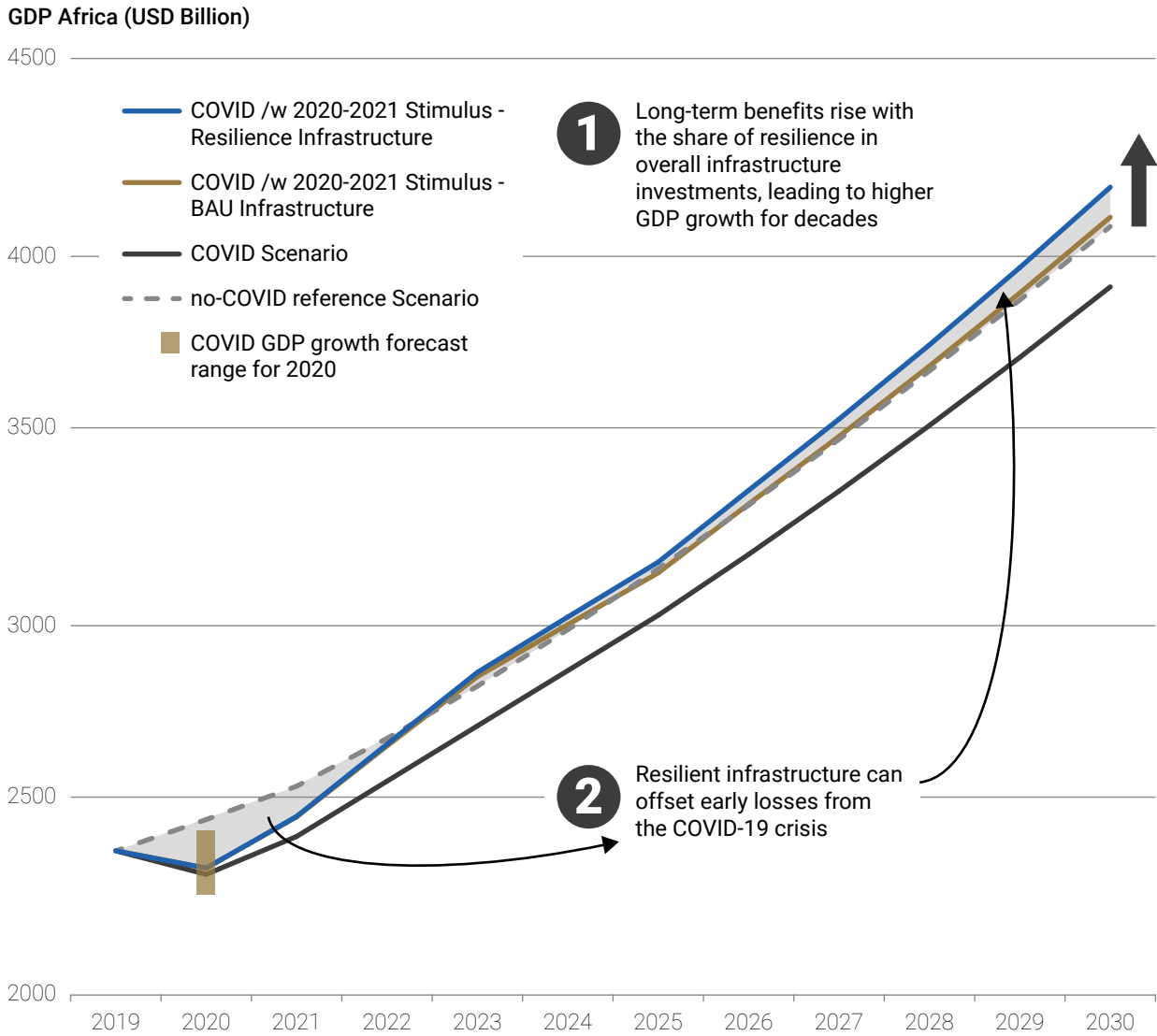
The Accelerated Water and Sanitation for All Programme, launched by UNICEF and funded by the Netherlands, has already helped 1 million Malian farmers, and aims to enhance WASH conditions and reduce climate-induced health risks, for an additional 224,000 people in eight African Countries.<sup>43</sup> Understanding the triple dividend of these types of programs, the Dutch government has, as a COVID-19 response, recently provided an addition \$7.5 million, to rapidly improve WASH conditions for more Africans in order to limit COVID-19 contagion risks.<sup>44</sup>

*"The COVID-19 pandemic has reinforced the critical role of initiatives like Africa Improved Foods to ensure we can guarantee Africa's food security while adapting to the impacts of climate change."*

**Feike Sijbesma**, Honorary Chairman, Royal DSM

**Figure One:**

Illustration of near- and long-term effects on GDP of the COVID-19 crisis and 2020-2021 investments in resilient infrastructure<sup>55</sup>



Adaptation solutions both are employment-intensive, creating an expected 500,000 extra jobs in Europe alone by 2050, and have a high return on investment, making them an excellent tool to overcome the current economic crisis while safeguarding livelihoods.<sup>56</sup> The Global Commission on Adaptation’s 2019 Report “Adapt Now: A Global Call for Leadership on Climate Resilience” found that investing \$1.8 trillion globally in five adaptation areas from 2020 to 2030 could generate \$7.1 trillion in total net benefits<sup>57</sup>.

As with climate and health responses, the current crisis is also an opportunity for the adaptation community to explore ways to expand the application of digital solutions. These have already proven to be effective for enhancing climate-health information exchange, to reduce impacts of extreme weather events, or for improving food security, for example, through the use of communications technology for micro-level drought preparedness in India.<sup>58</sup>

When facing such unique and novel threats, past experience is also not the best guide and innovation also becomes critically important. Adaptation to climate change is by definition an exercise in adjusting to a new circumstance and the value of innovation is equally significant.

## Climate-Resilient Infrastructure Finance

Attracting institutional investors to African infrastructure projects and bringing that source of financing to scale will require developing new financial instruments that institutional investors are willing to hold. Options include investing directly in Africa infrastructure, increasingly as partners in infrastructure funds, or leveraging Africa's pension funds to invest in resilient infrastructure projects<sup>59</sup>. For instance, Sub-Saharan African pension funds have about \$380 billion in assets under management that could be tapped as a source of investment for infrastructure<sup>60</sup>. Pension funds are already investing in infrastructure projects and service delivery to the poor in countries such as Cape Verde, Kenya, South Africa, Tanzania and Uganda<sup>61</sup>. By leveraging private and public funds, projects are able to increase both the sources and overall levels of financing. Another promising way of scaling institutional investment is to expand investment options through financial instruments such as resilience bonds. Securitizing an asset pool of African infrastructure and issuing resilience bonds can transform Africa infrastructure projects into low risk, liquid assets that can be attractive to institutional investors. Resilience bonds backed by the credit rating of issuing institutions such as the World Bank Group and the African Development Bank Group further reduces the risk of such bonds.

## CROSS CUTTING INITIATIVES TO EXPAND COLLECTIVE AND LOCALLY-LED ACTION

While the global measures on COVID-19 have emphasized the role of communities protecting each other, these global measures have neglected the conditions facing the world's vulnerable populations. The generally accepted measures don't work for the poorest populations. 60% of Africa's urban population live in slums where the increased contagion risk from COVID-19 is coupled with the fact that the popularly prescribed measures such as social distancing or staying inside is simply impossible<sup>62</sup>. Travel bans instituted across countries neglected the time and resources needed for migrant workers to travel back to their homes to wait out the COVID-19 crisis for better times<sup>63</sup>. Any COVID-19 response measures must explicitly engage urban slum communities and rural migrant populations in the design and implementation of response measures that work for their communities.

These policy recommendations must be underpinned by collective and locally-led action to ensure multiple stakeholders implement crisis response and adaptation measures built on good examples from existing community-led and designed interventions. Good examples of community owned and driven approaches exist around the world. Local authorities bringing citizens into confidence and empowering them to take their own measures sensibly has been a far more effective approach than where decisions have been imposed from the top-down.

Financial resources for adaptation investments as part of the COVID-19 stimulus must come in a coordinated manner from across the entire financial system. Governments and supporting international institutions can help optimize the deployment of capital by including climate-COVID eligibility criteria within public stimulus financing, the redeployment of internal resources of national international institutions and emergency international financial assistance packages.

Multilateral development banks have an important role to play in capacity building effort and creating project preparation tools to support a more rapid project cycle and implementation efforts. Significantly expanded technical and capacity support is necessary for countries to access currently available funding. Additional support to knowledge acceleration programs between countries will also increase capacity for increased adaptation programs.

“Climate-proofing” stimulus investments would dramatically increase the resources available for fighting climate change. The levels of public finance being deployed to tackle COVID-19 greatly exceeds all the funding for climate action globally and far outweighs the financing available for adaptation. Total global funding from all sources – public and private – for climate action in 2018 was \$546 billion with just \$30 billion invested in adaptation<sup>65</sup>. To date countries have spent an unprecedented \$8 trillion to address the COVID-19 health and economic crisis<sup>66</sup>. Additional measures could include the issuance of resilience bonds to make additional credit available for public and private sector actors which target triple dividend investments.

The stimulus spending will have long-term impacts especially when spent on major infrastructure, or on supporting selected technologies and even on particular social protection programs. Choices made quickly without considering the wider range of risks facing Africa, and especially the now inevitable impacts of climate change, could lock countries into high carbon and vulnerable options, closing off cleaner and more resilient paths. There is the risk that misguided allocation of the stimulus and recovery spending could lead to stranded assets, vulnerable populations and irreversible damage to natural assets such as the healthy ecosystems and watersheds upon which the livelihoods of so many ultimately depend.

### Strengthening policies for vulnerable populations through locally-led action

Mukuru slums in Nairobi, Kenya (covering almost 700 acres and over 100,000 households) was designated a Special Planning Area (SPA) by the county government. The local chapter of the federation of slum dwellers participated in a two-year participatory area-wide planning process for the development of a Mukuru Integrated Development Plan (MIDP). This large project involved area-wide planning, upgrading, and transformation of the slums, grounded on meaningful community participation and partnership between communities and the local government<sup>64</sup>.

*“Previous epidemic outbreaks have provided us with vital lessons, local knowledge and expertise that is also relevant in helping us to find innovative ways to address our climate crisis.”*

**Patrick Verkooijen**, CEO, Global Center on Adaptation

# A MORE RESILIENT FUTURE FOR AFRICA: ACTIONS TO SECURE A TRIPLE DIVIDEND

Faced with severe fiscal pressures, African governments have already moved to cut non-essential spending which could directly or indirectly affect funding for climate action. In addition to the above policy recommendations, this brief proposes to African Governments, development partners and the private sector an additional set of actions that would be deployed within a COVID-19 stimulus package to improve health, economy, and adaptation actions.

Actions			
ECONOMIC	FOOD	HEALTH	WATER
<p><b>1. Optimize resilience of stimulus</b></p> <p>to increase returns and reduce risks of funds deployed while restoring economic activity, jobs and livelihoods faster</p>	<p><b>1. Develop local markets and value chains</b></p> <p>to increase efficiency of meeting food supply and demand, reduce food import dependence and obtain more value from agriculture</p>	<p><b>1. Reinforce public health systems</b></p> <p>to focus support from fiscal space on enhancing health capabilities and services</p>	<p><b>1. Promote best sanitation and hygiene practices</b></p> <p>to support the suppression of community transmission of COVID and climate-sensitive disease</p>
<p><b>2. Invest in resilient infrastructure</b></p> <p>to provide a backbone of protection against compounding food-health-water crises and to accelerate recovery</p>	<p><b>2. Promote disaster resilient agriculture</b></p> <p>to increase protection of agricultural yields from climate shocks and ensure resilience of local food supplies</p>	<p><b>2. Promote health insurance coverage</b></p> <p>to enable populations to benefit from access to treatment despite economic hardship</p>	<p><b>2. Optimize water management</b></p> <p>to support the most effective distribution and use of scarce clean water resources</p>
<p><b>3. Support workforce protection</b></p> <p>to minimize pandemic, water and food borne disease transmission risks and health and productivity losses from heat exposure</p>	<p><b>3. Safety nets for food insecure households</b></p> <p>to deploy social protections to minimize the damage from climate extremes, famine and compounded health crises</p>	<p><b>3. Leverage digital solutions for awareness and tracking</b></p> <p>to maximize the power of digital tools to communicate and respond to climate-COVID health risks</p>	<p><b>3. Enhance water governance</b></p> <p>to promote cooperation and frameworks to more efficiently manage the supply and demand of water resources to meet critical health and agricultural needs</p>

*This policy brief was prepared by Matthew McKinnon, Seyni Nafo, Ian Noble, Jamal Saghir, Michiel Schaeffer and Jaehyang So from the Global Center on Adaptation. The team gratefully acknowledge the peer review and advice from Richard Damania, Chief Economist, Sustainable Development, World Bank Group. Appreciation is also expressed for the contributions to this policy brief of GCA colleagues: Sara Ahmed, Bruce Campbell, Saleem Huq, Michael Mullan and Louise Postema.*

# REFERENCES

- 1 World Bank (2020a): "Africa's Pulse: Assessing the Economic Impact of COVID-19 and Policy Responses in Sub-Saharan Africa" <https://openknowledge.worldbank.org/handle/10986/33541>, 55-56, 60-61.
- 2 Climate Change News (2020): "East Africa faces triple crisis of Covid-19, locusts and floods," <https://www.climatechangenews.com/2020/05/11/east-africa-faces-triple-crisis-covid-19-locusts-floods/>
- 3 African Development Bank Group (2020): "African Development Bank Group unveils \$10 billion response facility to curb COVID-19" <https://www.afdb.org/en/news-and-events/press-releases/african-development-bank-group-unveils-10-billion-response-facility-curb-covid-19-35174>
- 4 <https://www.worldbank.org/en/news/press-release/2020/04/17/world-bank-group-and-imf-mobilize-partners-in-the-fight-against-covid-19-in-africa>
- 5 UNECA: UN Economic Commission for Africa (2020) "COVID-19 in Africa: Protecting Lives and Economies", Addis Ababa. <https://www.uneca.org/publications/covid-19-africa-protecting-lives-and-economies>
- 6 IMF: International Monetary Fund (2012) "World Economic Outlook – Chapter 1: The great lockdown", Washington, DC, April. <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020> and data available from World Economic Outlook Database, April 2020. <https://www.imf.org/external/pubs/ft/weo/2020/01/weodata/> IMF: International Monetary Fund (2019) "World Economic Outlook: Global Manufacturing Downturn, Rising Trade Barriers", Washington, DC, October. <https://www.imf.org/en/Publications/WEO/Issues/2019/10/01/world-economic-outlook-october-2019> and data available from World Economic Outlook Database, January 2020. <https://www.imf.org/external/pubs/ft/weo/2019/02/weodata>
- 7 The Global Center on Adaptation (2020) Background Paper
- 8 Center for Strategic and International Studies (2020); Food and Agriculture Organization (2018): "The State of Food Security and Nutrition in the World. Building Climate Resilience for Food Security and Nutrition", xii, xiv, 61.
- 9 ODI (2013): Steve Wiggins & Sharada Keats, "Leaping and Learning: linking smallholders to markets", <https://www.odi.org/publications/7453-leaping-and-learning-linking-smallholders-markets>
- 10 CGIAR Research Program on Climate Change, Agriculture and Food Security (2020): "COVID-19: Flattening the food insecurity curve", <https://ccafs.cgiar.org/blog/covid-19-flattening-food-insecurity-curve#XrqHtRNKjnA>.
- 11 World Bank "Women, Agriculture and Work in Africa", <https://www.worldbank.org/en/programs/africa-myths-and-facts/publication/women-agriculture-and-work-in-africa>
- 12 United Nations Department of Economic and Social Affairs (UNDESA) (2020): "International Decade of Action 'Water of Life' 2005-2015", <https://www.un.org/waterforlifedecade/africa.shtml>
- 13 United Nations Department of Economic and Social Affairs (UNDESA) (2020): "International Decade of Action 'Water of Life' 2005-2015", <https://www.un.org/waterforlifedecade/africa.shtml>
- 14 The World Bank Group (2015): "A Plan to Spur Climate Resilient Infrastructure in Africa", <https://www.worldbank.org/en/news/feature/2015/12/09/a-plan-to-spur-climate-resilient-infrastructure-in-africa>
- 15 World Bank Group (2020b): "\$4.2 Trillion Can Be Saved by Investing in More Resilient Infrastructure, New World Bank Report Finds", <https://www.worldbank.org/en/news/press-release/2019/06/19/42-trillion-can-be-saved-by-investing-in-more-resilient-infrastructure-new-world-bank-report-finds>
- 16 World Bank Group (2020b).
- 17 European Commission (2014): "Assessing the Implications of Climate Change Adaptation on Employment in the EU", [https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate\\_change\\_employment\\_eu\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate_change_employment_eu_en.pdf), 43.
- 18 <https://www.worldbank.org/en/news/press-release/2019/06/19/42-trillion-can-be-saved-by-investing-in-more-resilient-infrastructure-new-world-bank-report-finds>
- 19 European Commission (2014): "Assessing the Implications of Climate Change Adaptation on Employment in the EU", [https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate\\_change\\_employment\\_eu\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate_change_employment_eu_en.pdf), 43.
- 20 Swiss Re (2016): "Pandemics in a changing climate – Evolving risk and the global response", [https://www.swissre.com/dam/jcr:552d59b2-76c6-4626-a91a-75b0ed58927e/Pandemics\\_in\\_a\\_changing\\_climate\\_Full\\_report\\_FINAL.pdf](https://www.swissre.com/dam/jcr:552d59b2-76c6-4626-a91a-75b0ed58927e/Pandemics_in_a_changing_climate_Full_report_FINAL.pdf)
- 21 World Health Organization (2019): "The 1.5 Health Report. Synthesis on Health & Climate Science in the IPCC SR1.5", [https://www.who.int/globalchange/181008\\_the\\_1\\_5\\_healthreport.pdf](https://www.who.int/globalchange/181008_the_1_5_healthreport.pdf)

- 22 <https://www.newscientist.com/article/2219981-how-deadly-disease-outbreaks-could-worsen-as-the-climate-changes/>
- 23 Brookings (2018): Homi Kharas et al., "Rethinking global poverty reduction in 2019", <https://www.brookings.edu/blog/future-development/2018/12/13/rethinking-global-poverty-reduction-in-2019/>; Gerszon Mahler et al. (2020).
- 24 Organisation for Economic Co-operation and Development (2019): "Revenue Statistics in Africa 2019", <https://www.oecd.org/ctp/revenue-statistics-in-africa-2617653x.htm>
- 25 United Nations Department of Economic and Social Affairs (2020a).
- 26 International Labour Office (2018): "Women and Men in the Informal Economy: A Statistical Picture", [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---comm/documents/publication/wcms\\_626831.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---comm/documents/publication/wcms_626831.pdf), 13; World Bank (2020), 60-61
- 27 World Bank Group (2020)
- 28 World Bank (2020). Africa Pulse, An analysis of issues shaping Africa's economic future <https://openknowledge.worldbank.org/handle/10986/33541>
- 29 <https://www.worldbank.org/en/news/press-release/2020/04/17/world-bank-group-and-imf-mobilize-partners-in-the-fight-against-covid-19-in-africa>
- 30 International Monetary Fund (2020b): "Policy Responses to COVID-19. Policy Tracker", <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>.
- 31 Global Commission on Adaptation (2019): "Adapt Now: A Global Call for Leadership on Climate Resilience", [https://cdn.gca.org/assets/2019-09/GlobalCommission\\_Report\\_FINAL.pdf](https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf)
- 32 Center for Strategic and International Studies (2020); Food and Agriculture Organization (2018): "The State of Food Security and Nutrition in the World. Building Climate Resilience for Food Security and Nutrition", xii, xiv, 61.
- 33 Center for Strategic and International Studies (2020); Food and Agriculture Organization (2018): "The State of Food Security and Nutrition in the World. Building Climate Resilience for Food Security and Nutrition", xii, xiv, 61
- 34 Food Agriculture Organization (2012): "Why Has Africa Become a Net Food Importer?", <http://www.fao.org/3/a-i2497e.pdf>
- 35 Food and Agriculture Organization (2011): "The role of women in agriculture", <http://www.fao.org/3/am307e/am307e00.pdf>, 3.
- 36 Feike Sijbesma (2019): "Wiping out hunger in Africa could cost just \$5bn. What are we waiting for?", The Guardian <https://www.theguardian.com/global-development/2019/jul/15/wiping-out-hunger-africa-could-cost-5bn-what-are-we-waiting-for>
- 37 CGIAR Research Program on Climate Change, Agriculture and Food Security (2018): "Agricultural advisory services at a global scale", <https://ccafs.cgiar.org/blog/agricultural-advisory-services-global-scale#XqrgwKgZ9c>; International Telecommunication Union (2019): "Turning digital technology innovation into climate action", <https://www.itu.int/en/publications/Documents/tsb/2019-Turning-digital-technology-innovation-into-climate-action/files/downloads/19-00405E-Turning-digital-technology-innovation.pdf>, 30-33; Rocky Mountain Institute (2020): "COVID-19, Data, and Climate Change", <https://rmi.org/covid-19-reinforces-datas-critical-intervention-role-with-climate-change/>.
- 38 EcoFarmer (2020): <https://www.ecofarmer.co.zw/>; Food and Agriculture Organization (.): "e-Agriculture Good Practice ZFU EcoFarmer Combo", <http://www.fao.org/3/i9030en/i9030EN.pdf>.
- 39 International Finance Corporation (2020): "Esoko Empowers Farmers, One Text at a Time", [https://www.ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/cm-stories/esoko-empowers-farmers-one-text-at-a-time](https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/cm-stories/esoko-empowers-farmers-one-text-at-a-time); F. Van Schalkwyk & A. Young (2017): "Ghana's Esoko: "Leveling the information playing field for smallholder farmers", [https://www.researchgate.net/publication/329865927\\_Ghana%27s\\_Esoko\\_Leveling\\_the\\_information\\_playing\\_field\\_for\\_smallholder\\_farmers](https://www.researchgate.net/publication/329865927_Ghana%27s_Esoko_Leveling_the_information_playing_field_for_smallholder_farmers).
- 40 GIZ (2018): "Access to Water and Sanitation in Sub-Saharan Africa", [https://www.oecd.org/water/GIZ\\_2018\\_Access\\_Study\\_Part%20I\\_Synthesis\\_Report.pdf](https://www.oecd.org/water/GIZ_2018_Access_Study_Part%20I_Synthesis_Report.pdf), 11-13; World Health Organization (2018), 21, 37.
- 41 UNICEF (2016): "The Impacts of Water, Sanitation and Hygiene on Key Health and Social Outcomes. Review of Evidence", [https://www.unicef.org/wash/files/The\\_Impact\\_of\\_WASH\\_on\\_Key\\_Social\\_and\\_Health\\_Outcomes\\_Review\\_of\\_Evidence.pdf](https://www.unicef.org/wash/files/The_Impact_of_WASH_on_Key_Social_and_Health_Outcomes_Review_of_Evidence.pdf), 6; V. Curtis & S. Cairncross (2003): "Effect of washing hands with soap on diarrhoea risk in the community: A systematic review." *Lancet Infect Dis* 3(5), 275-81.
- 42 <https://iwa-network.org/utilities-climate-resilience/>
- 43 Afrik21 (2019): "AFRICA: UNICEF launches phase 2 of DGIS-ASWA, for water and sanitation", <https://www.afrik21.africa/en/africa-unicef-launches-phase-2-of-dgis-aswa-for-water-and-sanitation/>.
- 44 Rijksoverheid (2020): « Beantwoording Kamervragen over impact COVID-19 op ontwikkelings samenwerking », <https://www.rijksoverheid.nl/onderwerpen/ontwikkelingssamenwerking/documenten/kamerstukken/2020/04/14/beantwoording-kamervragen-over-impact-covid-19-op-ontwikkelingssamenwerking>.

- 45 United Nations Department of Economic and Social Affairs (2020a).
- 46 The North Africa Post (2020): "Morocco: Government to cut non-essential spending due to Covid-19" <https://northafricapost.com/40032-government-to-cut-non-essential-spending-due-to-covid-19.html>; International Monetary Fund (2020).
- 47 International Labour Office (2018): "Women and Men in the Informal Economy: A Statistical Picture", [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---comm/documents/publication/wcms\\_626831.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---comm/documents/publication/wcms_626831.pdf), 13
- 48 World Bank (2020), 32-33, 60-61; Jumia (2019): "Hospitality Report Africa", [https://drive.google.com/file/d/1qffDm9P-jHYmpdsL1A8X\\_s\\_Wi\\_gXvj0l/view](https://drive.google.com/file/d/1qffDm9P-jHYmpdsL1A8X_s_Wi_gXvj0l/view);
- 49 United Nations Economic Commission for Africa (2020): "Communiqué - African Ministers of Finance - Immediate call for \$100 Billion support and agreement the crisis is deep and recovery will take much longer", <https://www.uneca.org/stories/communiqué-african-ministers-finance-immediate-call-100-billion-support-and-agreement-crisis>
- 50 Indicative numbers from Global Center on Adaptation background report.
- 51 Payne Institute of Public Policy (2020): J. Saghir & A. Tylim, "COVID-19: A Wake-up Call to Increase Access to Electricity in Africa", <https://payneinstitute.mines.edu/wp-content/uploads/sites/149/2020/04/Payne-Commentary-Series-COVID-19-A-Wake-up-Call-to-Increase-Access-to-Electricity-in-Africa.pdf>.
- 52 European Commission (2014).
- 53 McKinsey & Company (2020b): "Solving Africa's infrastructure paradox", <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/solving-africas-infrastructure-paradox#>; The Infrastructure Consortium for Africa (2018): "Key Achievements in the financing of African infrastructure in 2018", <https://www.icafrica.org/en/topics-programmes/key-achievements-in-the-financing-of-african-infrastructure-in-2018/>.
- 54 World Bank Group Global Facility for Disaster Reduction and Recovery (2019): S. Hallegatte et al. (2019).
- 55 (in addition to immediate socio-economic relief packages and debt pause not accounted for here). Resilience investments in the 2020-2021 period set the stage for countries to benefit from lower losses due to climate-related hazards and hence higher GDP for decades to come. The gradually accumulating returns on investment from resilience infrastructure lead to losses caused by the COVID-19 crisis be compensated and GDP by the of the 2020-2030 time period would start to exceed levels otherwise achieved without the COVID-19 crisis happening (green line). This does not happen with the lower returns on investments from "business-as-usual" infrastructure that do not also build resilience (dotted grey line). Source: GCA staff estimates, IMF, WBG, UNECA, McKinsey,
- 56 European Commission (2014): "Assessing the Implications of Climate Change Adaptation on Employment in the EU", [https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate\\_change\\_employment\\_eu\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/climate_change_employment_eu_en.pdf), 43.
- 57 Global Commission on Adaptation (2019) <https://gca.org/global-commission-on-adaptation/report>
- 58 International Telecommunication Union (2019): "Turning digital technology innovation into climate action", <https://www.itu.int/en/publications/Documents/tsb/2019-Turning-digital-technology-innovation-into-climate-action/files/downloads/19-00405E-Turning-digital-technology-innovation.pdf>, 30-33; International Crops Research Institute for the Semi-Arid Tropics (2007): "ICT-Enabled Knowledge Sharing in Support of Extension: Addressing the Agrarian Challenges of the Developing World Threatened by Climate Change, with a Case Study from India", <http://oar.icrisat.org/2604/>; World Health Organization (2018): 41. <https://www.who.int/publications-detail/cop24-special-report-health-climate-change>, 41.
- 59 Saghir J. (2018) Investment in Climate-Resilient African Infrastructure. Unlocking Value from Sustainable Renewable Energy. Renewable Energy Solutions for the Mediterranean and Africa. [http://www.res4med.org/wp-content/uploads/2018/07/RES4MEDAfrica\\_Unlocking-Value-from-Sustainable-Renewable-Energy\\_2018.pdf](http://www.res4med.org/wp-content/uploads/2018/07/RES4MEDAfrica_Unlocking-Value-from-Sustainable-Renewable-Energy_2018.pdf)
- 60 Amadou Sy (2017) Leveraging Pension Funds for Financing Infrastructure Development in Africa. Brookings Institution, NEPAD, <https://www.un.org/en/africa/osaa/pdf/pubs/2017pensionfunds.pdf>
- 61 Pension Funds and Private Equity: Unlocking Africa's Potential," Ashiagor, D, N. Satyamurthy, M. Casey, and J. Asare, Commonwealth Secretariat, 2014. [https://www.avca-africa.org/media/1329/pension\\_funds\\_and\\_private\\_equity\\_2014.pdf](https://www.avca-africa.org/media/1329/pension_funds_and_private_equity_2014.pdf)
- 62 United Nations (2015): "Millennium Development Goals Indicators. Indicator 7.10 Proportion of Urban Population Living in Slums, <http://mdgs.un.org/unsd/mdg/seriesdetail.aspx?srid=710>.
- 63 McKinsey&Company (2020c): "COVID-19: Briefing materials. Global health and crisis response", <https://www.mckinsey.com/~media/mckinsey/business%20functions/risk/our%20insights/covid%2019%20implications%20for%20business/covid%2019%20april%2013/covid-19-facts-and-insights-april-13-v2.ashx>; United Nations Department of Economic and Social Affairs (2020a); Bank (2020a), 25-29



- 64 <https://www.iied.org/planning-for-reality-one-nairobis-largest-slums>
- 65 Climate Policy Initiative (2019) "Global Landscape of Climate Finance 2019" <https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2019/>
- 66 International Monetary Fund (2020): April 2020 Fiscal Monitor. Chapter 1: Policies to Support People During the COVID-19 Pandemic. <https://www.imf.org/en/Publications/FM/Issues/2020/04/06/fiscal-monitor-april-2020#Chapter%201>
- 67 Brookings (2018): Homi Kharas et al., "Rethinking global poverty reduction in 2019", <https://www.brookings.edu/blog/future-development/2018/12/13/rethinking-global-poverty-reduction-in-2019/>; Gerszon Mahler et al. (2020).
- 68 Organisation for Economic Co-operation and Development (2019): "Revenue Statistics in Africa 2019", <https://www.oecd.org/ctp/revenue-statistics-in-africa-2617653x.htm>
- 69 United Nations Department of Economic and Social Affairs (2020a).
- 70 Brookings (2018): Homi Kharas et al., "Rethinking global poverty reduction in 2019", <https://www.brookings.edu/blog/future-development/2018/12/13/rethinking-global-poverty-reduction-in-2019/>; Gerszon Mahler et al. (2020).
- 71 Organisation for Economic Co-operation and Development (2019): "Revenue Statistics in Africa 2019", <https://www.oecd.org/ctp/revenue-statistics-in-africa-2617653x.htm>
- 72 United Nations Department of Economic and Social Affairs (2020a).

## **ABOUT THE GLOBAL CENTER ON ADAPTATION**

The Global Center on Adaptation (GCA) is an international organization which works as a solutions broker to accelerate action and support for adaptation solutions, from the international to the local, in partnership with the public and private sector, to ensure we learn from each other and work together for a climate resilient future. Founded in 2018, the GCA is hosted by the Netherlands, working from its headquarters in Rotterdam with a knowledge and research hub based in Groningen. The GCA is establishing a worldwide network of regional offices in Africa, Asia and the Americas, starting with a global innovation hub for climate adaptation in Beijing. Through this evolving network of offices and global and regional GCA teams, the organization engages in high-level policy activities, new research contributions, communications, and technical assistance to governments and the private sector.

For more information visit: [www.gca.org](http://www.gca.org)



**GLOBAL  
CENTER ON  
ADAPTATION**

**WILHELMINAKADE 149C  
3072 AP ROTTERDAM  
THE NETHERLANDS  
+31(0)88-3717800**