

COVID-19 IMPLICATIONS ON AFRICA'S RESEARCH AND POLICY

Insights from the Africa Research and Impact Network International
Conference and Seminars 2020

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About ARIN

The African Research and Impact Network (ARIN) is an impact platform that brings together a network of scholars and policymakers across Africa to leverage their knowledge and experiences in promoting research leadership, excellence, and impact pathways in the continent. Modelled as a network, ARIN seeks to foster connection and peer-learning amongst Researchers, Policymakers, and Practitioners who work in different fields within state and non-state organisations. The platform promotes sharing of transformative research and impact practices from different African contexts and beyond, enabling cross-disciplinary learning and sharing across contexts. ARIN work focuses on key sectors identified as critical for sustainable development of African Member States and as outlined in Africa's Agenda 2063. These include natural resource management, climate change, agriculture, forestry, energy, water, trade, gender, and cities.

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FOREWORD

Not since a century ago did a pandemic of global proportions wreak havoc on humanity. The Spanish Flu of 1919 has long been recognized as the most lethal global pandemic. Nevertheless, at the onset of the year 2020, the COVID-19 outbreak and its aftermath ground the world to a halt. Today's world is much more globalized than that of 1919, hence the more heightened consequences of the COVID-19 pandemic.

The COVID-19 pandemic has unfolded in a world struggling to cope with major global challenges. From global climate change to social unrest, global challenges have been mounting and concurrent efforts to address them have fallen short. Thus, when the pandemic struck, it exacerbated many of these challenges.

For Africa, the COVID-19 experience comes at a time when member countries had prepared development plans to enable a transition to sustainable industrialized economies in line with the AU Agenda 2063 and the Sustainable Development Goals (SDGs). Indeed, there have been concerns from the World Health Organization (WHO) and other commentators that Africa would be the most impacted region by the pandemic, owing to its weaker socio-economic safety nets. The pandemic has affected various sectors important to the continent's growth (cities, tourism, minerals, agriculture among others).

In fact, the COVID-19 pandemic threatens to drain away the sustainable development gains the continent has achieved over the last two or so decades. While the continent appears to have been spared the worst in terms of loss of life, cognate challenges have been made worse. The pandemic has reinforced already existing vulnerabilities within the continent. Communities and groups that did not have access to adequate sanitation services, for instance, have been most disadvantaged when responding to the pandemic.

Moreover, livelihoods for those who depend on daily wages have disappeared, especially due to mandated lockdowns with no social support for such vulnerable groups. Heavily indebted African countries are struggling to pay their debts, with most of them at risk of major defaults.

These vulnerabilities expose important challenges that characterize public policy in Africa. Limited technical and resource capacity has hampered effective responses to the pandemic. Uncertainty or even the absence of social safety nets has further exposed vulnerable groups to the pandemic. In response,

various actors have begun examining the impacts of the COVID-19 pandemic.

Of focus have been the challenges of responding to the pandemic, as well as opportunities to strengthen the capacity of African countries to effectively address future pandemics. It is within this context that the African Research & Impact Network (ARIN) convened the '*Africa in the Post Covid-19 World: Lessons for Research and Policy*' international conference on 18th to 20th November 2020.

Drawing on cutting-edge research that comprised eminent keynote speeches, panel sessions, presentations from an edited book volume, and thematic side events, the ARIN 2020 International Conference explored the impacts and lessons of COVID-19 in Africa. The conference was organized around three themes:

- i) COVID-19 implications on Climate and Natural Resource Dependent Societies
- ii) COVID-19 implications on Cities and COVID-19
- iii) COVID-19 implications on Science Technology & Innovation Policy

By examining these three themes, the conference placed COVID-19 and pandemic response within a richer context; one that appreciates the complex and interconnected nature of global challenges. The conference underscored the essence of timely engagement on the most pressing public challenges in the world generally, and the African context more specifically. The global scope of participants also accentuated the importance of engaging within and beyond Africa. After all, global challenges are shared but differentiated.

LIST OF ACRONYMS

ARIN	Africa Research & Impact Network
AU	African Union
AUDA-NEPAD	African Union Development Agency- New Partnership for Africa's Development
ASTII	Africa Science Technology and Innovation Indicators
COVID-19	Coronavirus 2019
GHGs	Green House Gases
NDCs	Nationally Determined Contributions
PPEs	Personal Protective Equipment
R&D	Research and Development
SDGs	Sustainable Development Goals
Solar PV	Solar Photovoltaic
STI	Science Technology Innovation

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EXECUTIVE SUMMARY

That the twenty-first century would be marked by complex challenges has been a long-accepted fact. The catastrophic impacts brought by the COVID-19 global pandemic have however crystallized the nature of such challenges. As the pandemic continues to claim millions of lives, devastate economies and rapture socio-economic safety nets, governments and other actors the world over has sought swift and effective remedial responses. But as is becoming apparent, the longer-term impacts of COVID-19 might be severe and far-reaching. Hence the need to explore the immediate, short- and long-term impacts of the pandemic.

From 18th to 20th November 2020, The Africa Research and Impact Network convened the inaugural ARIN Annual Conference to spur an international dialogue on lessons for post-COVID-19 research and policy. The conference focused on three thematic areas: Climate Change & COVID-19, Cities & COVID-19, and Science Technology and Policy & COVID-19, all of which are central to the ways in which the society has interacted with the pandemic.

The conference built on a series of ARIN *COVID-19 in Africa dialogues* convened between the months of April and November 2020 that brought together key stakeholders from the academia, policy, and practice to generate insights and lessons for strengthening Africa's research and policy in responding to the pandemic and post-COVID-19 recovery plans.

This technical report presents insights shared during the conference from over 100 scholars, policy makers, and innovators drawing on their experiences from different African contexts and beyond. The deliberations comprised eminent keynote speeches, thematic panel sessions, book chapter presentations, and side-events.

Five critical findings emerged from the conference:

- 1. Post COVID-19 Public Policy Review:** Overall, the COVID-19 has exposed the public policy challenges and deficits that Africa faces in light of the dynamic nature of risks. Risks are becoming not only more uncertain but also more acute and complex. The COVID-19 is largely a public health challenge but has, in addition, exacerbated other major public policy challenges such as socio-economic inequalities, alongside creating new frontiers of poverty and vulnerability, among others.

While the COVID-19 is in many ways a stark illustration of the characteristic nature of 21st century problems, policy re-orientation to account for this uncertainty is needed.

2. **Strengthening domestic systems:** Across the three themes of the conference, the value of domestic systems has been stressed, ranging from local and subnational climate action (under the Climate theme), local innovations (under the STI theme) and community/locally driven disaster management solutions (under the Cities theme).

Following the resultant global lockdowns and reduced importation and exportation of goods during the pandemic, most countries have had to depend on their locally available innovations and engagements to combat the situation. These locally driven innovations have multiple benefits such as: learning models through which multiple societal problems such as climate change and disasters can be addressed; promoting pro-poor action and responding to the context specific nature of impacts brought by global challenges such as the COVID-19; developing local innovation leadership for bottom-up policy and agenda setting.

3. **Building research and innovation leadership in the global South:** The COVID-19 pandemic has revealed that African countries can take leadership and tackling their domestic and international challenges. Strengthening leadership in the global South is key to promoting homegrown solutions and ensuring that policy approaches on STI, Climate change or building resilient tomorrow's cities are aligned to the circumstances and realities of context.

Building home-grown leadership and capabilities to tackle such challenges is likely to reinforce the development of effective policies that are aligned to the needs and circumstances of the continent. This is however not to say that partners from outside Africa are not valuable, but the African continent can engage better with the Northern and other Southern partners if it is organized and with a clear agenda that is aligned to the continent's priorities. This certainly calls for investments that will support such re-organization and positioning.

4. **Evidence and data platforms:** Understanding global trends and uncertainties of risks is largely dependent on continuous research, generation of evidence, and management of data to help predict and inform foresight policies. Global challenges are becoming more complex, and this requires a clear understanding of the processes and interlinkages as well as the trends associated with these challenges.

It is however worth noting that generating evidence and data is simply not enough to spur policy or culture change at the wake of uncertain events. The usability of the evidence and data is thus critical given the huge amount of data that exists but has not been utilized for relevant policy interventions. Moving forward, African governments need to invest more in developing data and evidence management platforms that could provide reliable and sustained surveillance systems, and projections of potential risks and future pandemics.

In conclusion, the foregoing discussions at the ARIN International Conference 2020 reveal that COVID-19 is a harbinger of future public policy challenges. These challenges will be more complex, have significant impact, and unforeseen if not inevitable. The post COVID-19 world will therefore no longer be business as usual. Africa in particular, and the world in general, have to awaken and prepare for these growing public policy challenges. It is hoped that the ARIN conference sparked and seeded important deliberations that outline the contours of remedial and anticipatory responses to analogous challenges, which will undoubtedly be plentiful in the twenty-first century.

ACKNOWLEDGEMENTS

The organization and execution of the ARIN Conference 2020 was overseen by the ARIN Secretariat based in Nairobi, Kenya. The ARIN focal points from the five regional organizations i.e., East, Central & Francophone, West, Southern Africa, and the diaspora provided useful guidance in the design and execution of the conference in an integrated manner. Additionally, the ARIN fellows from over 26 African countries were key conduits to linking the conference discussions to their respective countries and organizations.

The ARIN Secretariat extends its gratitude to the eminent keynote speakers, panelists, moderators, and discussants for their motivating and diverse perspectives that unpacked the complexity of science, COVID-19, and policy. The nine book chapter presenters and discussants who provided useful empirical and contextual case studies brought forth rich content of empirical, theoretical and practical experiences. Special acknowledgement goes to the over 200 participants who graced the three-day conference and actively engaged in the various sessions providing thought provoking questions and insights.

Knowledge and resources to support the conference were leveraged from specific ongoing research projects implemented by the ARIN fellows in various parts of Africa and beyond. Special acknowledgement goes to the *Tomorrow's Cities-Nairobi Risk Hub* funded by the UK Research and Innovation (UKRI)'s - Global Challenge Research Fund (GCRF), which provided fundamental partnership and insights in the framing of the conference theme. The *Africa Sustainability Hub* funded by the Economic and Social Research Council (ESRC) through the *STEPS Centre*. The *Governing the Sociotechnical Transformations* project funded by the Belmont Foundation aided the thinking around various pathways to societal interactions with the COVID-19, while the project *Strengthening Climate Action in the Global South* project supported by the Volkswagen Foundation was critical in informing debates under the climate change theme. Lastly, the *Knowledge Systems Innovations and the Assessing STI Metrics in Africa* projects supported by the Foreign Commonwealth Development Office were useful in setting the scene for the Science, Technology and Policy & COVID-19 theme.

INTRODUCTION

1.1 Background and rationale

The COVID-19 pandemic has led to devastating outcomes across the world. Currently, more than 1,600,000 people have succumbed to the virus, with over 50 million infections recorded globally.¹ The African continent accounts for about 1 percent and 3 percent of these deaths and infections, respectively. Although the death toll across the continent is still below the previously predicted levels by the WHO and other sources, the unraveling socioeconomic disruptions are enormous.

These are characterized by domestic and continental supply shocks with adverse impacts on local and international trade: reduced foreign driven investments; weak external demand associated with lockdowns in major export markets like Europe and USA; and disruptions in key service sectors such as tourism, transport, and communication that have led to massive layoffs. Recent estimates by the World Bank show that COVID-19 could push 40 to 60 million people globally into extreme poverty, 27 million of whom live in Sub-Saharan Africa (Dabalen & Paci, 2020).

The impact will continue to be felt the hardest in urban areas and in the informal sector, which employs around 80% of the population in low-income countries. Despite these statistics, the overall and actual COVID-19 impact on the African continent remains speculative. A clear understanding of the pandemic in terms of its triggers, spread, health impacts, socio-economic implications, and the effectiveness of current responses is crucial if countries are to adequately harness lessons to inform a response to future pandemics.

This is particularly important for the African continent: despite the continent being the least developed and with limited capacity to handle the pandemic, it is also extremely exposed and vulnerable to other disaster risks, both natural and anthropogenic (Lone & Ahmad, 2020).

Evidence shows that the outbreak and spread of the COVID-19 into Africa has exacerbated existing disaster risks of both climatic and anthropogenic nature (Phillips et al., 2020, p. 586).

The pandemic is also shaping and reshaping various segments of the society

¹ <https://coronavirus.jhu.edu/>, as of 21 December 2020

including knowledge systems, disaster risk management and preparedness, community response, behaviors, and cultures.

The impacts on the economy, governance, and social norms of the society cannot be underestimated. The unfolding of the COVID-19 pandemic and the efforts by African governments and stakeholders to save lives, secure livelihoods, and prepare for the future can be harnessed as lessons to help build resilience in Africa beyond the pandemic.

The response to the pandemic at the continental level gives valuable lessons that can benefit Africa not only in terms of risk preparedness, but also in terms of continental research focus, knowledge management, policy, and practice. This is crucial to achieving the continent's development goals and aspirations as envisioned in Agenda 2063 and the global SDGs. The ARIN Conference 2020 provided a platform for stakeholders to share lessons learned and best practices from the COVID-19 pandemic.

1.2 Objectives

The ARIN Conference focused on lessons learned from the COVID-19 pandemic that could inform practice, policy, and research to help the African continent build resilience towards its Agenda 2063 aspirations and sustainable development. Specifically, the conference drew lessons along the following themes:

1. Climate and Natural Resource Dependent Societies/partnerships and COVID-19
2. Cities and COVID-19
3. Science Technology Policy and COVID-19

1.3 Fit within ARIN activities

The Africa Research and Impact Network (ARIN) is an impact platform that brings together a network of scholars and policymakers across Africa. Modeled as a network, ARIN seeks to leverage on the capabilities of African talented scholars in a flexible manner. ARIN's core focus is to engage in peer learning and sharing transformative research and impact practices.

Areas of focus include natural resource management, climate change, agriculture, forestry, energy, water, and cities.

The conference was a strategic opportunity for ARIN to convene dialogues among diverse stakeholders drawn from Africa and beyond on COVID-19 and the future of Africa. Specific discussions were focused on lessons from various sectors and contexts, and how these could be leveraged to inform risk-prepared research excellence and impact pathways.

Further, with the thematic book chapter presentations, the conference incorporated peer learning and transformative information sharing for research and impact with respect to COVID-19 pandemic.

1.4 Organization of the conference

The three-day conference was organized along three themes, as summarized in the table below:

Theme	Support/Side event
Day 1: Climate and Natural Resource Dependent Societies/partnerships and COVID-19 Discussions in this session centered on reflecting and exploring various approaches for strengthening the resilience of African societies to the impacts of climate change and COVID-19	Day 1: Gendered impacts of COVID-19 This event aimed at highlighting the impacts of COVID-19 and responsive measures in the spirit of not leaving anyone behind, and social inclusion.
Day 2: Cities and COVID-19 Conversations revolved around the emerging lessons in terms policy and research for city resilience.	Day 2: Research Collaborations and Partnerships Beyond COVID-19 Explored the visions and efforts to re-imagine research societies and partnerships beyond COVID-19.
Day 3: Science Technology Policy and COVID-19 The discussions explored the application of STI as a tool for post COVID-19 pandemic recovery, and tenets of measures for improving the social and economic sustainability during and after the COVID-19 pandemic.	Day 3: Impacts of STI Indicators in Policy Processes and Strategies for Supporting Uptake This event explored the impact of STI indicators for policy making, within the overall context of COVID-19

1.5 Expected outputs/outcomes

The conference outputs include conference proceedings (detailing the ongoings at the conference), this technical report (highlighting key messages from the deliberations), various thematic information and research briefs, and policy briefs. Ultimately, the book chapters discussed will be reviewed and consolidated into an edited book volume. The key outcomes from the conference would include a revamped platform/forum for reviewing and documenting lessons drawn from COVID-19, in a palatable and simplified way for uptake for policy makers, practitioners and researchers globally.

1.6 Structure of the report

This report provides key highlights derived from the rich deliberations from the various thematic sessions. The first section of the report gives the general introduction to the report highlighting the rationale and key objectives for the conference, and how the conference contributes to the focus or ARIN, through the thematic focus and the key outputs and outcomes. The following section focuses on the highlights from the *Climate and Natural Resource Dependent Societies/partnerships and COVID-19* theme with insights derived from the keynote speeches, the lessons from the panel discussions, key summaries. This section generally provides the reflections on approaches for strengthening the climate change resilience of African societies, beyond COVID-19.

The third section of the report provides perspectives on how cities (and city societies and infrastructure), have evolved with COVID-19. Centered on the *Cities and COVID-19* theme, the section highlights the lessons for policy, practice and research associated with key perspectives from key opinion leaders on resilience building. The fourth section focuses on the *Science Technology Policy and COVID-19* theme, with emphasis on the application of STI as a tool for post COVID-19 pandemic recovery, and lessons drawn on improving the social and economic sustainability during and after the COVID-19 pandemic. The section also explores the impact of STI indicators for policy making, within the overall context of COVID-19, through the support event on *Impacts of STI Indicators in Policy Processes and Strategies for Supporting Uptake*.

The final section provides the high level wrap up, emphasizing the main deliberations and take-home messages from the conference, and foresighted concluding remarks towards the second annual ARIN conference, as well as the monthly formal and informal seminars on thematic foci of the ARIN platform.

THEME 1

2. COVID-19 IMPLICATIONS FOR CLIMATE AND NATURAL RESOURCE DEPENDENT SOCIETIES

2.1 Introduction

COVID-19 pandemic has put enormous strain on global economies, social settings, the ecological environment, as well as the natural resources sustaining them. This is in addition to the already significant impacts of climate change, which include changing weather patterns, rising sea levels, and more extreme weather events. The poorest and most vulnerable people in the developing world especially the African continent are being affected the most (Lindsey et al., 2020; Phillips et al., 2020).

Heightened climate action is therefore pertinent to overcoming the apparent development crisis in the world in general, and Africa in particular, towards sustainable natural resource management and climate-resilient pathways (McNamara et al., 2020). As the world is planning to cope with the aftermath of the COVID-19 pandemic, discussions on how to link economic recovery with climate action have been vibrant (Belesova et al., 2020; Howarth et al., 2020; Newell & Dale, 2020).

At the center of the debates is the argument on the need to ensure that post-pandemic economy recovery supports climate action and natural resource resilience (Barbier & Burgess, 2020; Mori et al., 2020). It is within this context that this session sought to facilitate these discussions centred on reflecting and exploring various approaches for strengthening the resilience of African societies to the impacts of climate change and COVID-19. Specifically, the session aimed to:

1. To discuss COVID-19 as a developmental crisis
2. To analyze the Climate Change and COVID-19 nexus
3. To explore ways in which the African societies could leverage on the experiences and opportunities presented by COVID-19 to catalyze climate action
4. To reflect on how economic recovery beyond COVID-19 could involve building resource dependent societies.

2.2 Overview of the session

This being the first day of the conference, thematic focused discussions were preceded by opening speeches from the ARIN Convener, Dr Joanes Atela, and a representative of the Chief Guest, Prof Hamadi Iddi Boga, the Principal Secretary of the State Department for Agricultural Research in the Ministry of Agriculture, Livestock and Fisheries. This was followed by a keynote address from Dr Richard Munang, the Africa Regional Climate Change Programme Coordinator at UNEP.

Next was a guided panel discussion moderated by Prof Thomas Hale from Oxford University, with a distinguished set of panelists, Dr Funzo Somorin of the African Development Bank and Prof. Wilkister Moturi of Egerton University, who tackled questions around respective focus areas and responded to subsequent questions from the audience. To wrap the discussions, a synthesis of key highlights from the day's deliberations was presented by the session rapporteurs, Kennedy Mbeva & Michael Boule.

The session was chaired by Victoria Chengo, a Research Fellow at the African Centre for Technology Studies. Three chapters under the Climate Change and COVID-19 theme from the upcoming ARIN book volume titled 'Africa in the Post COVID-19 World: Lessons for Research & Policy' were presented and discussed. The table below shows the details of the chapters presented.

Chapter Title	Presenting author
Building Community resilience through Climate Communication: Lessons from COVID-19	Dr. Michaelina Almaz Yohannis (University of Nairobi)
Climate Change Action during Post-COVID-19 Era	Mr Charles Tonui (ARIN/ACTS)
Responses to COVID-19 and climate action in the East African community: key lessons from the case of Kenya	Dr. Shazia Chaudhry (University of Nairobi)

2.3 Insights and Discussions

The following sub-sections highlight some of the key overarching arguments that arose from the discussions:

2.3.1. COVID-19 has Exposed the Hidden Frontiers of Poverty and Vulnerabilities Driving the Accumulation of Climate-Related Risks in Africa.

Discussions generally alluded that the COVID-19 experience both in terms of spread, impacts and response mechanisms has depicted the changing dynamics of poverty and vulnerability to climate change that need to be well understood. More specifically, the pandemic has exposed and intensified the vulnerabilities especially of poor local communities whose livelihoods are dependent on available social structures and wage- bills.

On one hand, the livelihood assets upon which most communities in Africa depend have been ravaged by the lockdowns, broken supply chains and general destruction of small enterprises, social networks, and industrial activities that are core to climate resilience both for households and businesses (Atela et al., 2010). There are concerns that the COVID-19 pandemic could push more than 80-100 million people into extreme poverty, a majority of whom live in the sub-Saharan Africa where social safety nets are weak² (Lakner et al., 2020).

Deliberations noted that currently African Governments are providing temporal cushions to the vulnerable people through relief and cash support programmes, but there is a concern that these measures are unsustainable, and that the long-term aftermath could be the weakening and disruption of adaptive capacity of both urban and rural poor to climate change. This could be attributed to the strained livelihood assets and further intensifying the already existing vulnerabilities especially in the absence of inclusive economic growth models. While reinforcing the existing vulnerabilities, the dynamic poverty and vulnerabilities is also evident with the creation of new frontiers of vulnerabilities.

Discussions indicated that most communities in Africa have been pushed to a new phase of poverty and climate vulnerabilities. The emergence of the ‘New poor’ owing to the COVID-19 pandemic is a major policy concern. The new poor in this case mainly includes individuals/communities whose income levels

² measured using the international poverty line of \$1.90/day

are rated above the poverty line, but this income and livelihoods are still not pandemic proof. The resultant massive layoffs have generated a new cadre of ‘poor people’ who are more vulnerable to emerging shocks such as climatically driven floods and food insecurities. For instance, in Kenya, more than 1000 city residents lost their jobs and incomes and have had to degrade to slum dwellings, making them more susceptible to floods, heat waves among other climatic impacts.

Ultimately, the above dynamics show that while Africa is targeting to achieve sustainable development, the systems to achieve this development are still relatively unstable and susceptible to shocks, and that pandemics such as the COVID-19 could easily undo decades worth of Africa’s development gains while exposing the existing vulnerabilities. To this end, governments must consider pro-poor policy options that target the vulnerable as a key to building back better and embracing climate resilient and sustainable post-COVID recovery path.

2.3.2 Strengthening linkages between sub-national action and national-level political goodwill is key to building resilience to pandemics such as the COVID-19 and could be leveraged to create long term climate resilience benefits and consciousness

The COVID-19 has raised a level of consciousness within Governments to understand and appreciate the essence of local action to resilience building. Sub-national actors and community networks have notably played a critical role in supporting livelihoods and businesses especially the poor in Africa³. A key argument from the conference is that local actors have been promoting initiatives pertinent to the needs of local communities across and in response to COVID-19.

These networks have emerged as crucial in Africa in many ways. For instance, they have formed a new mode of governance, loosely referred to as the ‘last mile’ governance model, that plays an important role in bridging the gap created by insufficient state capacity (i.e., resources, outreach, evidence etc.) to effectively address the needs of communities, especially the marginalized populations. These gaps include lack of proper understanding and integration of the needs of the poor (i.e., residents of informal settlement, local communities in marginalized areas, socially oppressed groups e.tc.) in the

³ <https://www.arin-africa.org/2020/08/05/building-community-networks-to-respond-to-the-covid-19-pandemic-in-africa-through-last-mile-initiatives-authors-kennedy-mbeva-victoria-chengo-and-joanes-atela/>

decision-making processes and most importantly during pandemics such as the COVID-19.

This novel role has seen national governments giving attention to these local processes and creating structures that leverage these actions to inform national decisions. Such structures include the establishment of community surveillance committees that link community actions and needs to the national decision making and reporting processes. In most cases, this has resulted to better utilization of resources and a national outlook that accounts for subnational actions. These actions and reporting structures could be useful for climate action, given that sub-national actors have continuously played a critical role in climate action but have not been given the necessary political attention to ensure that such actions are upscaled, reported, and legitimized accordingly.

Therefore, climate change policy processes in Africa such as the attainment of the NDCs could leverage on such opportunities to upscale bottom-up linkages, structures, and surveillance systems to catalyze sub-national climate action and resilience building, linking to the national processes. The case of Kenya presented during the conference shows that the Government of Kenya has put in place strategic initiatives to harness collective and individual experiences to build resilience beyond the pandemic.

This is based on the recognition that Kenya has numerous external fragilities such as: high dependence on commodity exports, relatively weak sovereign balance sheet, high debt burden and volatile currency. The national government has recognized climate change as part of the shock that characterize the COVID-19 nexus and has thus created linkages (e.g., through national, county/subnational, and community strategy building and dialogues).

By so doing, the Government recognizes the role of sub-national governments (counties and local communities) in generating evidence and spurring shared responsibility in the COVID-19 response especially in generating evidence and support national government's decisions and reporting to the WHO.

“The Ministry of Agriculture is currently implementing a Ten-Year Agricultural Sector Transformation and Growth Strategy (ASTGS), despite the COVID-19, floods, and locust invasion crises. The strategy is written in such a way that Pillar 9; focuses on responding to crises, recognizing that the crises that we face are

largely economic, disease, and climate related. At the Ministry of Agriculture level, we realized that when COVID-19 came, we were scrambling to look for information and data, which then was such a big challenge, which made us realize that the producers of knowledge and information are relevant and critical in every crisis that we are facing and more so what is coming in future.” [Prof Hamadi Iddi Boga, the Principal Secretary of the State Department for Agricultural Research in the Ministry of Agriculture, Livestock and Fisheries, Kenya]

2.3.4 The COVID-19 recovery and complementary financial solutions for climate action.

The interaction between climate change & COVID-19 is to a great extent intricate. There is a greater concern that most resources and funding that could have been deployed to support climate change have now been re-directed to fighting COVID-19. In addition, the anticipated post-COVID-19 recovery plans could possibly take carbon intensive pathways and create new emission pathways, thereby draining climate gains made so far.

Thus, joint interventions in terms of policy and economic responses are required. That is, COVID-19 responses need to include climate action (Bogojević, 2020; Newell & Dale, 2020; Phillips et al., 2020). For instance, the use of solar PV for electricity generation (instead of fossil fuels) could be adopted to enhance health resilience e.g., solar enabled hospital facilities and equipment (Gebreslassie, 2020).

Climate change adaptation, the dominant climate financing focus in Africa has been targeted to building resilient and healthy societies and enhance low-carbon development. Hence, greening recovery plans and stimulus packages by mainstreaming clean technologies and green jobs and climate smart practices in the post-COVID-19 recovery plans is essential.

“There will be no COVID-19 money and climate change adaptation money.... Huge resource allocation which was not initially in the work plan has now been redirected to addressing COVID-19. This is the same resource that would have gone to financing adaptation initiatives in the continent. However, investment in social protection programmes that address both climate change and COVID-19 to build dual economic

*resilience seems to have taken off.” [Dr Funzo Somorin,
Regional Principal Officer at the African Development Bank]*

On the other hand, mitigation initiatives have been targeted to build resilience and address the root causes of climate change, establishing the role of biodiversity laws, and managing the interaction between humans and wildlife. Policies and resources around biodiversity conservation, agriculture, and pandemic response can be redirected to catalyze and mobilize private sector investments in initiatives relevant for climate change and COVID-19 e.g., in agricultural value chains.

Additionally, the continent cannot heavily rely on global development aid, which is currently overstretched, hence the need to explore local finance innovations that can address the nexus. A key option in this is to build bottom-up financial systems and institutions that are low-risk, affordable, and accessible by the local climate actors including the informal sector where formal structures are out of reach. Research needs to inform how community cooperatives that are accessible and relevant to the diverse needs of the informal sector could be incentivized as a driver of recovery.

2.3.4 Strengthening multidimensional resilience thinking and actions in the society

A key argument that emerged from the deliberations, especially the panel discussion is the fact that there seems to be some connections between response to COVID-19 and climate resilience and adaptation actions. In other words, the pandemic has created avenues for linking resilience to climate change and pandemics. The containment measures that have been implemented to curb the spread of the disease can be directly associated with climate action and sustainability⁴.

For instance, refrained human activities such as travels have led to reduced emissions, virtual engagement has supported green actions such as the shift to paperless transactions. The WHO guidelines measures aim to create social protection, improve information flow, innovate, and boost economic resilience. Therefore, the global community is striving to increase resilience and adaptation measures in the face of COVID-19.

⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7498239/>

This has provided an opportunity for homegrown innovations to address the existing challenges. For example, African cities were already struggling in managing waste, thus, biodegradable masks could be produced to reduce generation of more solid waste.

“Basic hygiene is also a critical practice for the containment of COVID-19, but which requires a lot of water and well-designed sanitation systems. Wastewater from handwashing, recycling, water conservation, and public awareness could be an opportunity for research, as part of climate adaptation in the face of water scarcity. Water insecure countries have driven innovations and awareness to lead to water-wise behaviors.” [Prof Wilkister Moturi, Egerton University]

In addition, behavioral changes such as the adoption of plant-based diets and indigenous/local foods and reduced transportation of food are critical for urban cities to bounce back. Behavior change is difficult to achieve, therefore transdisciplinary is key to understanding how we can bring about these changes.

Mobilized country action and local-led efforts need to use this momentum to drive innovation for climate action and build resilience for tomorrow’s cities.

“It is always necessary to have a good mix of technology and indigenous solutions that are relatable to local contexts. Building trust in traditional systems is a key asset. Practices should complement not compete or exclude.” [Dr Funzo Somorin, Regional Principal Officer at the African Development Bank]

2.4.5. Building resource dependent societies and informal towards economic recovery could create double win for climate resilience and the Paris Agreement.

Climate change continues to largely impact the African continent mostly through droughts and floods. GHG emissions are also projected to continue rising at the wake of COVID-19. This calls for a more pressing urgency for solutions to rebuild Africa’s economic recovery which does not heavily rely on natural resources as it has in the past. Africa’s development needs to be reorganized, with climate resilience as a key approach to achieving Agenda

2063 and SDGs.

“Africa’s GDP is projected to reduce by 1.5% owing to the COVID-19 pandemic, shrinking income of over 70% of African households. An urgency for solutions has never been more pressing. How do we accelerate progress towards achieving Africa’s Agenda 2063 and the SDGs?” [Dr Richard Munang, the Africa Regional Climate Change Programme Coordinator at UNEP]

The recovery process thus needs to include a strategic consideration of three key elements. First, Africa needs to rebuild through the informal sector. The informal sector is responsible for the majority of livelihoods across the continent that support adaptation. To drive locally available technologies and productive economies, it is therefore critical to explore what enablers/incentives are needed to support the sector, how to facilitate access to affordable financing and the role of policy to address the financing challenges within the sector.

Secondly, the abundance of solar energy in Africa has sprouted a catalytic energy sector, complemented by the vibrant agriculture value chains (Mohammed Wazed et al., 2018). This demonstrates a resource competitive advantage of Africa. Agriculture, the most inclusive sector that employs about 60% of Africa’s workforce and the clean energy (solar) industry, align to development and climate priorities (Osabohien et al., 2020). These sectors have great potential to create multiple jobs and nature-based solutions to increase yields while decentralizing energy. In addition, there is a need to reprioritize natural resources in a manner that nullifies the misleading narratives such as the historical role of oil and minerals, and that only a small percentage of Africa has access to them.

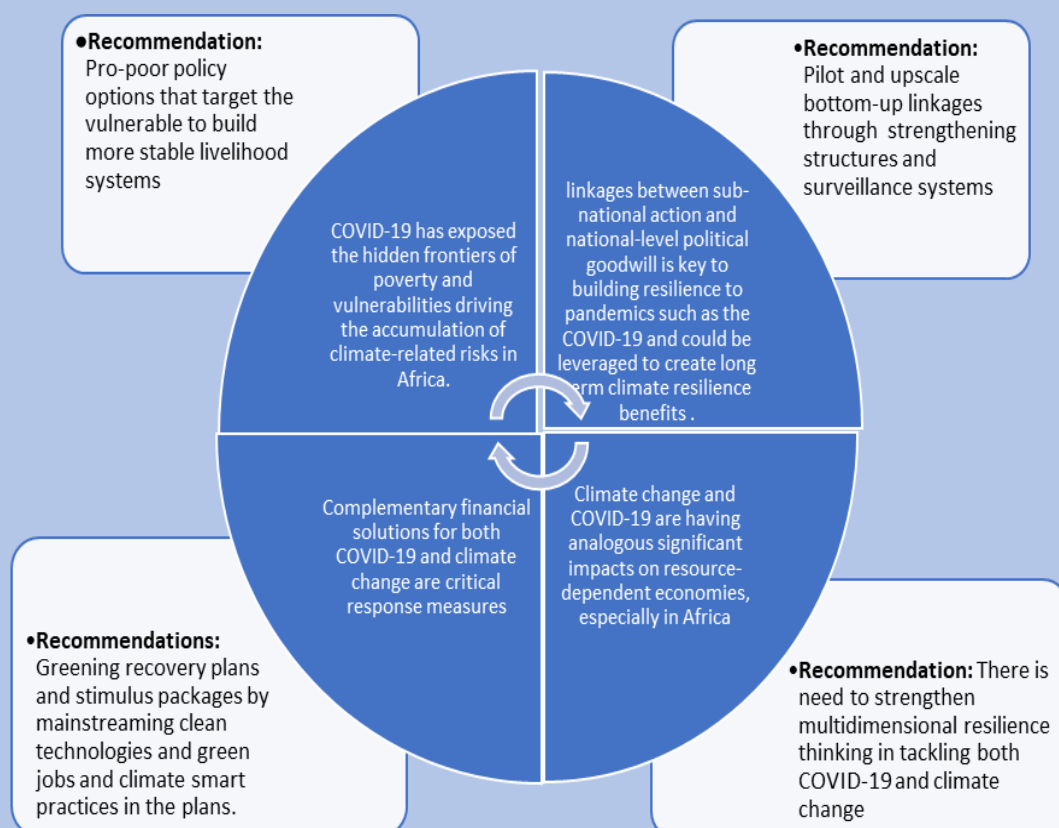
Third, there is a need to leverage financing institutions that are low-risk, affordable and accessible by the informal sector where formal structures are out of reach. Research needs to inform how community cooperatives that are accessible and relevant to the diverse needs of the informal sector could be incentivized as a driver of recovery.

2.4 Conclusion and Recommendations

At the wake of the COVID-19 pandemic, the world faces more than just a health crisis but also an economic, food, and climate crisis. In sum, post

COVID-19 recovery will not be easy, but the benefits of hard work will be worthwhile and imperative not only for survival, but for the African continent to thrive. A consensus across the board is required to deepen partnerships and evidence base to find solutions, work from a common perspective to rethink development and transition to a climate smart world. There are certainly several intersection points between COVID-19 and climate change.

The pandemic response and recovery particularly provide platforms for anchoring dimension and perspectives for climate action including leverage innovative governance models and financial models to spur climate action. Currently, however, these opportunities are not obviously available as both efforts and actions towards the pandemic continue to happen in an isolated crisis response manner while climate change action awaits the COVID-19 ‘ceasefire’. It is therefore important that climate action and discussions be integrated early enough into the COVID-19 discussions. This will require intentional steps from the governments and climate champions. Some of the steps /recommendations that could be considered in this learning process are outlined in the figure below.



THEME 2

3. COVID-19 IMPLICATIONS ON CITIES AND SOCIETY

3.1 Background and context

The high concentration of populations and economic activities in cities make them hotpots for the COVID-19 pandemic and related impacts. Globally, cities account for over 95% of the reported infections. Similarly, the pandemic has had adverse impacts on the socio-political and economic status, and the ecological environment of urban societies (Bai et al., 2020; Chirisa et al., 2020). Given the numerous and longstanding vulnerabilities and risks in African cities, the pandemic presented and continues to pose serious challenges to Africa's urban populations (Barnard, 2020; Finn & Kobayashi, 2020).

The urbanization dynamics in the continent especially the vast informality processes not only create risks but exacerbate the impacts of the pandemic. Over 60% of the African urban population live in crowded informal settlements devoid of basic services, which make it difficult to observe the physical distancing and hygiene (hand-washing) regulations instituted by governments to contain the spread of the pandemic (Cherunya et al., 2020; Zerbo et al., 2020).

Further, majority of Africa's urban populations depend on the informal economy for their livelihoods. Consequently, lockdowns and movement restrictions have had huge socio-economic impacts on urban populations and especially the poor who largely depend on the informal sector. For instance, studies carried out in five slums in Nairobi in May/April, a month after the first case was reported in Kenya indicated that about 81% of those interviewed had completely or partly lost their source of livelihoods.

Impacts on the service industry (hotels, education, tourism, transport, among others) and manufacturing industry that employ a large share of the population have also led to significant job losses among the urban population. The huge medical waste being generated in cities is also beginning to cause concern as cities and urban populations are ill prepared to manage the magnitude and nature of this waste.

Cities are the economic engines of development accounting for over 50% of GDP in most African countries (Bandauko et al., 2020). Further, the future of Africa is projected to be urban with 50% of the population expected to live in

cities by the year 2035. Given the significant socio-economic, health, and environment impacts of COVID-19 on cities and the strategic roles they play, it is critical that cities are at the centre of the recovery processes.

This therefore calls for serious conversations on how to ensure resilience in cities that can withstand future shocks and stresses in the post-COVID-19 era. The Cities and COVID-19 session held on the second day of the ARIN Conference 2020 provided a forum for these deliberations to take place. Conversations revolved around the emerging lessons in terms of policy and research for city resilience. Attention was given to what has been (based on current evidence), what is desired (resilient city imaginaries), and the necessary pathways towards resilient African cities (beyond the pandemic). Specific objectives for the session included:

1. Unpacking the concept of resilience in the context of African cities, while offering an understanding to the possible imaginaries of a 'resilient city' post COVID-19.
2. Identifying innovative and effective steps/pathways that cities can follow during the recovery process towards realizing the imagined resilient city post-COVID-19.
3. Understanding the implications of the pandemic on Africa's urbanization processes and drawing key emerging lessons for policy and practice that would enable city planners, managers, and policy makers to create more functional and livable cities post-COVID-19.
4. Establishing the key lessons for research in relation to COVID-19 and cities by first seeking an understanding of the role of research and researchers during the pandemic.
5. Understanding how COVID-19 has shaped city-building relations and the possible strategic partnerships that would be critical in fostering sustainable and effective rebuilding processes, especially in the continent.

3.2 Overview of the session

The session was organized into three main areas: the keynote speech, chapter presentations and panel discussions. Prof. Jason Corburn, a City and Public Health expert presented the keynote speech. Prof. Corburn outlined 10 key elements that could guide policymakers and practitioners in creating resilient cities Post-COVID-19. The second session involved presentations and review of book chapters relating to cities and COVID-19, across the African continent. These chapters are meant for an upcoming book publication by

ARIN. The presentations are listed in the table below.

Chapter Title	Presenting Author
Multi-hazard system Approach and Risk Modelling for Resilient cities	Victoria Chengo (ACTS, Nairobi Risk Hub/ARIN)
Sanitation: A Key Consideration in Ghana's COVID-19 Response	Dr. Regina Edziyie (Kwame Nkrumah University, Ghana)
Building a Mural of an African City beyond COVID-19	Dr. Joel Onyango (ARIN/ACTS)

The final session involved panel discussion moderated by Prof. Mark Pelling, a Risk and Resilience expert from Kings College, London. Five panelists ranging from researchers, practitioners and policymakers shared their perspectives on different aspects related to cities and COVID-19. Dr. Gilbert Siame from the University of Zambia, and Prof. Alfred Omenya, an Urban Development practitioner and the African representative to the International Building Quality Centre, gave perspectives on the effects of COVID-19 on the urbanization processes in the Africa continent and possible lessons for policy.

Leo Saldanha, an Environmentalist from India explored the emerging issues in terms of relations and governance during periods of crisis and highlighted potential strategic partnerships that would be critical in fostering sustainable and effective rebuilding process, especially in the developing countries.

Dorcas Nthoki, a Researcher from TU Dortmund University shared perspectives on the role of research and researchers during the pandemic and rebuilding process in the African context and potential areas of improvements for research. Dr. George Mwaniki, a Lead UNFCCC Consultant, discussed the experiences and interventions by African Cities in responding to the pandemic. The session closed with the Rapporteurs (Tom Randa and Rose Akombe) synthesizing the key emerging issues. The session was chaired by Dr. Keziah Mwang'a, an urban development specialist and researcher at the African Centre for Technology Studies. The sections below provide the detailed deliberations and discussions from the session.

3.3 Insights and Discussions

The deliberations were informed by the underlying issues such as complex urbanization dynamics and projections in Africa, where more than half of the continent's population is expected to live in cities by the year 2035, the rapid and unplanned urban growth, the increasing number of the urban poor, the longstanding vulnerabilities and risks, and the need to re-evaluate the effectiveness of most urban systems in African cities in responding to the pandemic. Conversations revolved around past and current cities' response to the pandemic, potential pathways to rebuilding resilience post COVID-19, and the emerging lessons for research, policy, and practice. The key emerging messages are outlined below.

3.3.1 People centered and gender sensitive risk management policies are critical for building preparedness to pandemics and other disasters

According to Prof. Jason Corburn, resilient cities are partly characterized by healthy and equitable urban societies. Creating urban resilience post-COVID-19 will therefore require the prioritization of healthy human equity, socio-economic and political inclusion. This will in part constitute to a focus on health inequities that exacerbate vulnerability; urban vulnerability and its impact on ecosystems and populations; and a recognition of people-centred approaches that promote equitable governance not just science and technology.

The response to COVID-19 in most Global South states has been top-down, centralized, and imitative of the developed world's mechanisms. In addition, national governments have been imposing restrictions to their populations without due analysis and a clear understanding of their needs and the potential implications of such actions. Yet, the behavior change advocated for by these emergency directives can only be embraced through people driven policies that motivate culture shift.

Most African governments, in responding to COVID-19, operate on emergency directives rather than grounded policy frameworks. Such an approach has left a trail of devastating consequences, with millions of people losing sources of livelihoods and more exposed to a wide range of accumulated risks. According to Pelling et al (2020), excluding people in the decision processes is a pathway to risk accumulation because decisions that are meant to reduce risks are not aligned with people's needs and aspirations, serve the interests of a few and actually recreates new risks and conflicts.

Other than consequences, the heavy-handed approach has also reinforced mistrust between the people and their governments. This draws on historical experiences where government promises have remained unfulfilled or where partial policy implementation exists. Eroded trust has therefore meant that government policies are sometimes faced with implementation deficits.

“There are very few countries that implemented lockdowns in a graded way and in a way that took the people into consideration - so when we talk about relationships, I don’t think most governments had a relationship with their people...There is a great lack of maturity in dealing with this crisis. If you have seen the newspapers you would have seen the migrant crisis, for instance that India was singularly responsible for causing millions to return to their villages and with no plan for them. There was no plan to work with them, to help them through the summer months, and they do not plan to return so quickly to their jobs in the cities. So, the city economies have crumbled. This basically tells you that the way in which a pandemic is handled is largely a political question.” [Leo Saldana, Principal Investigator, the Governance of Socio Technical Imaginaries project]

Further, the centralized approach to the pandemic where the central government directs all responses is not only unable to effectively reach the grassroot levels but has a potential to undermine lower-level government systems. Subnational governments such as counties in Kenya are central to developing and implementing people centred policies that are aligned to national and global (WHO recommendations) standards, thus able to draw resources and opportunities and deploy these where they are needed most i.e., to the poor and vulnerable communities. This underscores the importance of proper governance and inclusion in building resilient urban systems as observed by one of the panelists.

“The questions of governance cannot escape what we have seen and what we might see in the future. And when I talk of governance I am talking of real decision-making and incomplete decentralization that has happened on the continent. Central governments are coming down with a very strong hand and displacing the role of Mayors and the

role of City governments...it is time to really begin to think of devolving much to the local level and having coordination and development processes happening at the micro-level.”

[Dr. Gilbert Siame, University of Zambia]

People-centered policies should also be gender sensitive. Different types of gender have strategic roles in driving behavior change in responding to pandemics and other disasters. There is a need to place women, youth, persons with disabilities and other vulnerable groups at the core of urban planning, with a focus on their roles and how these roles can be enhanced. Further, in dealing with such groups, the focus should not be the deficits or what is lacking but what potential exists including indigenous knowledge systems. The successful elimination of the Ebola pandemic is a case example, where community and local expertise played a fundamental role in averting the crisis.

3.3.2 Pandemics are complex with multifaceted and cascading impacts that require integrated risk management strategies

Globally, COVID-19 emerged as a public health crisis. Consequently, states adopted a health-focused response that included strengthening health systems through equipping the capacity of hospitals with beds and medical personnel, procurement of test kits and Personal Protective Equipment (PPEs) among others. Over time however, the pandemic evolved to manifest social, economic, and environmental challenges. Further, the pandemic unearthed and exacerbated existing vulnerabilities especially the high dependence on the informal sector for most African city dwellers, the limited access to services in informal settlements, the fragile food supply chains, and transportation networks. Effective response that ensures resilience in cities will therefore need to consider the multi-dimensional implications of the pandemic and provide multifaceted solutions, as observed by one of the panelists.

“The biggest lesson is that as planners and practitioners of urban development, we must always understand that our interventions, our plans and our proposals happen within a broader ecosystem, and it is futile to generate plans and hope they will work without dealing with the economics, the social and political issues, coordination of the pandemic response and so on.” *[Prof. Alfred Omenya, Eco Build Africa]*

This is particularly important in the Global South and especially in African cities where the pandemic impacts are compounded by other natural and anthropogenic disaster risks that further weaken the capacities of the residents and the systems to respond and withstand shocks. Discussions stressed the need to build back better and enhance the resilience of the city systems by embracing a multi-hazard system thinking and risk modelling that allow for early warning and risk preparedness. For a start, this will entail a paradigm shift of focus to view resilience in cities beyond the physical structures and capacity, and interrogate the resilience of the local health, social and economic systems.

Secondly, interventions will need to pay attention to the apparent and potential multiple stressors that make communities vulnerable to subsequent shocks. This is in recognition that social and environmental stressors such as food insecurity, inadequate access to water, air pollution, among other issues that impact people make them more susceptible to risks such as COVID-19. Consequently, the local inequalities and vulnerabilities of the existing systems must be considered and adequately addressed. Community level mapping can help identify and fashion solutions to current and future stressors as well as mitigate against multiple toxic stressors.

Thirdly, it was suggested that building resilience in African Cities beyond COVI -19 requires responses that adopt a semblance of the three horizons framework and that consider ecological, economic, and policy aspects. The critical issues for urban resilience identified revolved around the underlying drivers such as rapid urbanization, loss of green spaces, increasing urban risks and unsustainable infrastructure, and socio-economic systems. The need to sustainably manage urbanization and consider cities as systems with the major elements and processes whose interlinkages define the cities is therefore key for future urban resilience in the continent.

3.3.3 Impacts of global pandemics such as COVID-19 are highly contextual thus context-specific actions could better respond to different societal needs.

Consideration of the place and context of an event is key. The physical and social positions of people are critical determinants of the real and potential impacts of disasters. The effects of COVID-19 have been felt differently across

the globe, across and within states and cities⁵. Globally, cities are adversely hit compared to rural settings, accounting for over 95% of the reported cases. Within cities, informal and low-income settlements are more impacted. Identification and elimination of inequities across a range of populations and places is therefore key since these exacerbate vulnerabilities that compound the impacts of pandemics such as COVID-19.

For instance, an analysis on who is more vulnerable to COVID-19 in Latin America showed that afro-descendants are more vulnerable because of where they live, pre-existing health conditions and existing racial inequalities (UNFPA, 2020).

In such situations, ‘urban acupuncture’ which involves the use of highly targeted catalytic projects identified, in collaboration with affected communities can be utilized to create healthy urban resilience during and post-COVID-19. This will include among others the re-thinking and redesigning of places with inhabitants and especially the most vulnerable in our response to COVID-19 towards the desired outcomes. An example of successful ‘urban acupuncture’ is the once crime-ridden Medellin city in Colombia where community co-designed projects to deliver services to the informal settlements such as cable cars for transport, escalators, parks etc. led to enhanced livelihoods and reduced crime⁶.

The rebuilding of resilience in cities will also require a good understanding of the complexity and diversity of cities. This understanding is not only important in identifying the necessary and effective interventions but also makes us more careful about applying simplistic generalization to the complex problems of cities.

“Understanding cities means narrowing down to the micro level and understanding what cities are made of who makes cities, and who actually lives in these cities. The discourse for the past five years since 2015 when the record hit half of the global population living in cities has always focused on that magnitude of the population. But I think it requires a paradigm shift or a more focused perspective understanding who exactly is living in the cities. And for the context of

⁵ OPINION: COVID-19 demonstrates urgent need for cities to prepare for pandemics, <https://unhabitat.org/opinion-covid-19-demonstrates-urgent-need-for-cities-to-prepare-for-pandemics>

⁶ Treating violence like a disease helped cut Colombia's murder rate by 82%, <https://apolitical.com>

Africa, it is a large population of young people who live in the cities, whose ideas can be shaped into a more sustainable future to make more resilient cities. It is a population that is shifting away from what we have always known as shaping cities - the industrial and manufacturing sectors. It is a population that is more and more focused on innovation, sustainable development, entrepreneurship, and solutions to make cities work. And this is a group of people that we need to harness to make our cities more resilient to deal with all these problems that we're facing in cities.” [Dorcas Nthoki, Tu Dortmund University]

3.3.4 Decolonizing Agenda Setting in urban development processes and post-COVID-19 plans

Discussions pointed to the need for ‘de-colonizing agenda setting’ especially by international organizations, most of which are based in the global north, by questioning who and what they serve, and recognizing that local expertise and experiences are a much better fit in dealing with urban challenges and promoting health resilience.

Decision-making and support organizations on health, cities and COVID-19 are mainly headquartered in developed economies with very few in the Global South. Over 80% of international health organizations that are shaping the global health agenda and response to COVID-19 are based in the UK and USA, with only 7% based in Sub-Saharan Africa, and 5% in Asia. The representation of the global South voices in these agencies is also grim, with only 17% of leadership (CEOs and Board Chairs) coming from low and middle-income countries (home to 83% of the world population) and the rest (83%) from the global North (home to 17% of the world population)⁷.

“This is a very inequitable and a legacy of colonial Global Health that we're seeing..., without the voices of those in African cities, in Latin American cities and Asian cities shaping the agenda, shaping the science, and shaping policy.” [Prof. Jason Corburn, UC Berkeley]

Despite these inequities in representation, the World has been conditioned and

⁷ GLOBAL HEALTH 50/50 REPORT, 2020, Power, Privilege and Priorities, <https://globalhealth5050.org/wp-content/uploads/2020/03/Power-Privilege-and-Priorities-2020-Global-Health-5050-Report.pdf>

continues to depend on expertise and development advice from the global North, in some cases undermining local expertise and communities with lived experiences and potential for better solution generation.

“The developed world and elite institutions’ experience with COVID-19 and previous pandemics like Ebola where most of their models have been consistently wrong necessitates the need to question, and then push back and not agree to the idea that just because it is coming from one of these elite institutions, that’s legitimate science.” [Prof. Jason Corburn, UC Berkeley]

Discussions pointed to the fact that COVID-19 is slowly eroding this dependence. First, through the high infection rates reported in developed nations that have forced them to focus attention and available resources on addressing domestic issues. Second, the magnitude and complexity of the pandemic that seems to overwhelm the developed nations.

“The other thing that is coming out strongly is that there are some perspectives that have changed because of this pandemic. One of them is the walls that were built during the colonial times in the hearts and minds of most Africans that are coming down. When you look closely, most of the countries that have been really hit hard are in the West, where they are considered more developed. The Western world has been highly regarded countries that are capable of managing and making decisions to avert a big disaster. But after the COVID-19 experience, I think that that narrative is not holding anymore, which I’m guessing in the future might bring some interesting innovations moving forward.” [George Mwaniki, UNFCCC Consultant]

Indeed, the inward-looking approach adopted by the Global North in response to COVID-19, forced most African countries to be innovative and to look within for solutions with some measure of success. The initial responses by most African countries that included lockdowns and curfews to some extent served to contain the virus and minimize its spread, particularly to the rural settings that are characterized by weak healthy systems.

Again, with very limited international interventions, local actors arose to fill the gap by providing directions and solutions. Within the Kenyan slums, community organizations like the Slum Dwellers International (SDI) have been critical in translating government directives and providing COVID-19 related information to local communities. Sub-national governments in Kenya have also taken leadership in manufacturing and providing supplies such as PPES that ordinarily would have been expected to be imported.

Further, the government of Kenya has taken measures to cushion vulnerable groups through targeted programmes like the *Kazi Mtaani*⁸.

“For example, again if you come to African cities and how the cities are trying to respond to this challenge, some of the social safety nets were historically geared towards supporting the old and the disabled. But this is the first time for example in Nairobi we have a government dedicating a huge budget for ‘Kazi kwa Vijana’ supporting the young men and women who are unemployed and without sources of income. So that is already an innovation that is coming from the government and I hope it can be built on as one of the disaster kind of response strategies moving forward. In most African settings the young usually do support the old so if you support the young you are actually supporting the entire generation.”
[George Mwaniki, UNFCCC Consultant]

3.3.5 Evidence generation and data are key in the COVID-19 response and future risk management in the cities.

The role of research in building resilient cities beyond the COVID-19 pandemic came out strongly in the discussions. While the pandemic has exposed the existing gaps in city systems, the extent of vulnerabilities and interlinkages of hazards and disasters, critical questions still remain unanswered especially in terms of how the cities are expected to change due to the pandemic. The path to sustainable urban recovery is still not clear in most African cities and the interventions seem to be replicated from one city to the other with less consideration of the local situations and systems. The answers to these questions will require insights from studies and research to enable the responsible authorities to move beyond the singular focus on socio-economic

⁸ <https://housingandurban.go.ke/national-hygiene-programme-kazi-mtaani/>

recovery to a holistic sustainable recovery and rebuilding of resilient African cities.

The role of research and science in building resilient cities through issues and context interrogation and informing policies and practice is therefore key.

“Such research requires a wholesome understanding from a spatial dimension, environmental dimension, economic dimension, but also understanding that the individual who is the micro-level person cuts across all these spheres that we’re talking about in cities. So how do we really understand the individual living in cities, how they live, how they move about in cities, how they interact with each other, and tying all this with governance and understanding how to govern a certain group of people that is dominant in cities, in order to make our cities more resilient and to deal with the recovery process of cities post COVID-19.” [Dorcas Nthoki, Tu Dortmund University]

Effective and transformative research requires a connection between research and practice that is characterized by several feedback loops. The need for these feedback loops has emerged strongly under the unpredictable COVID-19 environment.

“The key lesson for practitioners and policy makers during and post-COVID-19 is therefore the need for doing research and applying it in the practical sense and then getting knowledge, learning, and unlearning things, and then applying what we have learned or unlearned into the research process again, and then reapplying it again and the loop goes on and on.” [Dorcas Nthoki, Tu Dortmund University]

It is such research that is concerned with understanding what is happening and applying research in both spheres of planning and practice that will be critical in providing answers to the practical questions.

“For instance, how do we plan our houses such that we have more livable homes now that most people have to work from home? How do we create neighborhoods instead of just creating houses, how do we have a mixed-use plan such that we reduce the distances in accessing places of necessity

whether it's shopping or work or places of opportunity where people require to go to in order to build their own livelihoods?"[Dorcas Nthoki, Tu Dortmund University]

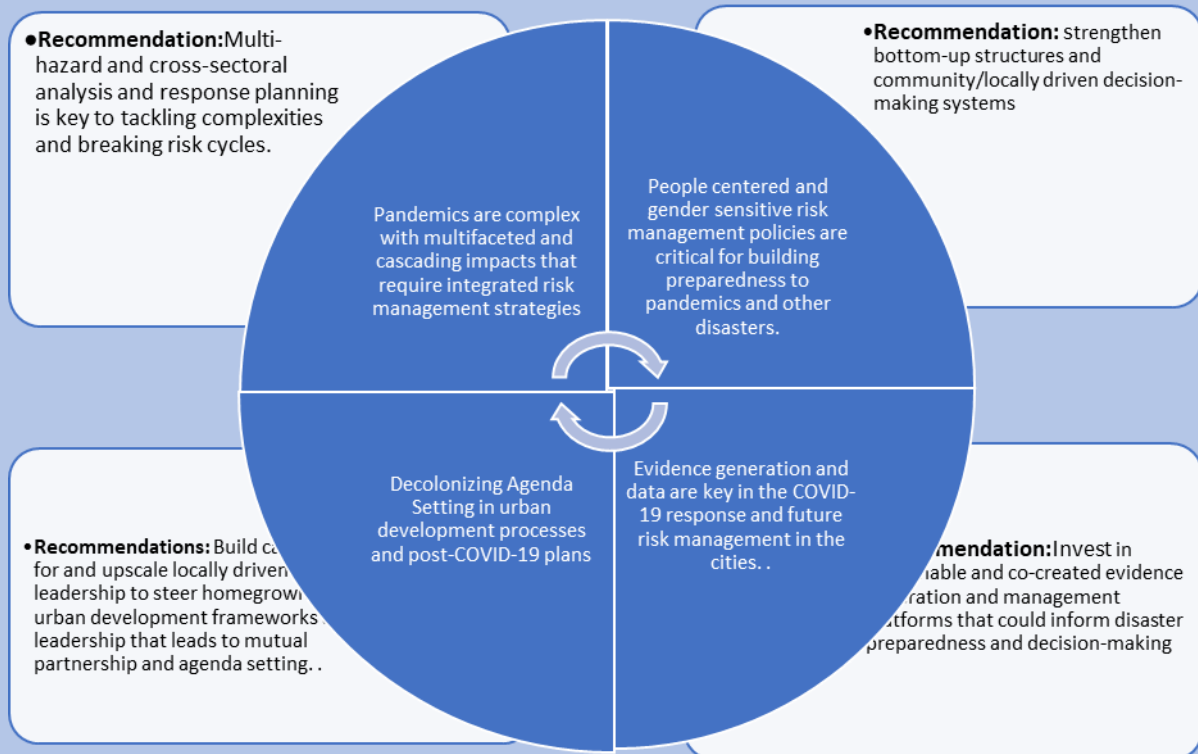
3.4 Summary Findings and Conclusions

Overall, the discussions and deliberations were centered on building the desired resilient African cities by diagnosing the existing gaps as exposed by the pandemic and pointing at the areas to focus on to achieve the desired African cities post the pandemic period. The COVID-19 was the single and perhaps the most recent factor to have reversed the most common rural urban migration in Africa, revealing the need to ensure that African cities are well linked with the rural areas to ensure sustainability.

In building more resilient cities which are not only functional but livable, the cities' capacity should be defined and the supporting systems for such capacities be developed, considering the entire value chain of the city systems such as the food systems and the waste management systems in the city. In addition, the infrastructural development in the city must be considered without forgetting its linkage to other cities and rural settings, not forgetting the promotion of devolved governance to capture the local issues and vulnerabilities which when addressed promote resilience, and finally embedding sustainable development thinking and practice.

The need to identify local vulnerabilities in our cities and prioritize actions for recovery and rebuilding better is evident. The role of research to inform the process is critical and thus the need to utilize local knowledge and innovation to enhance resilience in the African cities. Similarly, there is a need for 'de-colonizing agenda setting' especially by international organizations, most of which are based in the global north by questioning who and what they serve, recognizing that local expertise and experiences are a much better fit in dealing with urban challenges and promoting health resilience. Additionally, there is a need to take cognizance of citizen science especially its importance in narrowing in on risks and capitalizing on this to come up with targeted interventions for vulnerable groups.

Finally, to build back better and enhance the resilience of the city systems, will require multi-hazard systems thinking, and risk modelling coupled with inclusive governance systems that take into consideration people's concerns.



THEME 3

4. COVID – 19 IMPLICATIONS ON SCIENCE TECHNOLOGY AND INNOVATION POLICY

4.1 Science Technology Policy and COVID-19

Science Technology Policy and COVID-19 thematic session reflected on Science and Technology as tools for supporting a rapid and sustainable recovery from the pandemic. Key discussions featured ideas around supporting STI as tools for inclusiveness, improving science policy advisory capacities, and measuring their effectiveness and key levers of change that STI needs to build upon.

Science Technology and Innovation has been at the centre stage and their applications (including new policies through inter-African research collaborations), have seen new research schemes in various sectors more so in the health sector. Innovations locally, nationally, and regionally have proliferated. The ARIN network has strived to engage in dialogues that have informed how best to harness the applications of STI and draw lessons for science policy.

The day three conference session comprised of a keynote address, six draft book chapter presentations, and a panel session discussing broad STI thematic areas. The chapters presented, broadly covered issues around STI and COVID-19 response and recovery. The session was organized to address the following objectives:

1. To establish how STI can be used as tools for rapid and sustainable recovery from the COVID-19 pandemic.
2. To explore science policy- advisory and capacities can be supported at both the national and at the global levels
3. Identifying levers of change (e.g., international co-operation; open science and technology, emerging technologies, STI roadmaps and capacity building etc.) are needed to support social and economic sustainability during and after the pandemic.

4.2 Overview of the session

The conference session was organized in three parts. A keynote address from Prof. Joanna Chataway, Head of Department of the Science, Technology,

Engineering and Public Policy (STePP) in the Faculty of Engineering Sciences at University College London (UCL), who emphasized the role of public policy, investments in STI policy, supporting inclusion and new measurement frameworks for STI. The keynote address was followed by presentations of the draft chapters which saw the chapter discussants provide feedback (Dr. Elsie Onsongo of Nuvoni Research and Dr. Leah Mwai of FCDO, East Africa Research and Innovation Hub).

A panel session moderated by Dr. Joanes Atela proceeded, that included the following panelists: Prof. Susan Hartley (University of Sheffield, UK), Prof Geoffrey Boulton (University of Edinburgh, UK), Prof. John Ouma Mugabe (ITI, University of Pretoria) and Prof. Erika Kraemer-Mbula (University of Johannesburg). The panel discussion was followed by a question-and-answer session, and finally a synthesis of the proceedings and key messages. Various book chapters were presented during the session, as summarized in the table below.

Chapter Title	Presenting Author
Regional Security Arrangements status in a Pandemic era	Charles Kisame Tana Copenhagen
Pitfalls and lessons from Ghana's Strategies for containing and managing the ramifications of COVID-19	Dr. Matthew Mabefam, The University of Melbourne
Harnessing the potentials of Africa's traditional medicine in managing the COVID-19	Dr. Samuel Olajuyigbe, University of Ibadan, Ibadan, Nigeria
Border Politics and Pandemic Responses in Africa	Dr. Kennedy Mbeva, ARIN
Role of Science Technology and Innovation in supporting emergency response solutions in Africa	Nora Ndege, ACTS/University of Sussex

4.3. Insights and Discussions

The following paragraphs highlight some of the key overarching arguments/insights that arose from the discussions:

4.3.1. Contextualized/Localized Science Technology and Innovation as tools for building back better post-COVID-19

Science, Technology, and Innovation in the context of COVID-19 offers enormous potential as tools that can be harnessed to support building back better after the pandemic. The STI tools have been rapidly mobilized by diverse actors in the STI ecosystem to address COVID-19, and have provided solutions such as funding, vaccines development, treatments, research collaboration and knowledge sharing etc.

The proliferation of innovations and new technologies witnessed in response to COVID-19 has created a need to rethink policies that will ensure preparedness pre-, during, and post-pandemic. Such innovations, policies and technologies are called to be locally applicable and require driven/homegrown STI solutions for the issues we face. Historically, STI ideologies have been driven by broader conceptual understanding and global competitiveness but with the COVID-19 experience, Africa has witnessed numerous contextualized/local innovations that are critical in offering solutions especially to a majority of populations.

The local innovations have actually bridged the gap created by [insufficient state capacity](#) (i.e., resources, outreach, evidence etc.) to effectively address the needs of communities, especially the marginalized populations.

“We need to expand the lens through which we look at the issue with STI policy at local levels and this needs to be based on local realities and local context and adapt an understanding of a broad range of social political and economic factors which will interact with science and innovation and condition the impact that it has.” [Prof. Joanna Chataway, University College London]

4.3.2. Developing and rethinking new lenses of STI policies for risk management.

The COVID-19 pandemic has highlighted the current unsustainable mode of development with high mass production and industrialization. STI policies need to move away from current development discourse, and emphasize and support ideas such as inclusiveness, multiple actor collaboration, using various sources of knowledge and disciplines in order to trigger a transition towards sustainability. Proponents of de-growth have also called for such ideas

(Pansera and Fressoli, 2020).

Such efforts support the current crises as well as recovery. Turnheim, Asquith and Geels (2020) postulates that during times of crises and shocks, a rethink and multiple ways around how we configure investments and strategies is needed to support a transition that meets varied and diverse goals. They further emphasize the importance of collective efforts where actors such as policy makers develop new capacities to deal with a variety of stakeholders (those included and excluded); support experimentation (*including failures*); monitor progress on multiple components (not just inputs); develop new measurement frameworks to govern the transitions while integrating diverse knowledges, disciplines etc.

This is the time to rethink our investment models and frameworks applied in the STI policy for sustainability including support of policy experimentation. Firstly, there is a need to develop STI policies that will mitigate the unforeseen negative impacts of certain innovations. To do so, collaboration and inclusion of all stakeholders in the foundational development of various STI policies is needed. Secondly, there is a need to embrace emerging framings such as mission-oriented innovation policies (Mazzucato, 2018); responsible innovation (Stilgoe, Owen and Macnaghten, 2013); transformative innovation policy (Schot and Steinmueller, 2018), and transformative knowledge systems approach (Marshall et al., forthcoming) which will be instrumental to the research community, towards a new policy agenda.

The transformative knowledge systems framing, for example, integrates science, policy, and economic development. In so doing, different methodologies are employed to engage people and the research community including new ways to measure and explore the outcomes of research and innovation in more detail.

Lastly, these ideas and framings therefore call for the construction of an evaluation agenda along with STI policy agendas that explore in more detail the connections between input outputs and outcomes that are desired.

4.3.3. Harnessing the opportunity space for redefining STI policies

While it emerged that there is an opportunity to develop new lenses for STI policies, current COVID-19 responses and strategies have opened up opportunities for building new public policies that would embrace innovation and preparedness. The COVID-19 crisis has provided a window of opportunity

to rethink ways in which STI policies can be made more useful to the society. Coupled with unprecedented impacts, the pandemic has awakened opportunities that were not known, exposing the key STI policy gaps for Africa.

We are now witnessing the efforts towards refining public policies to respond to the changing nature of societal challenges. For instance, industrial public policy has/is gaining traction through manufacturing now that various countries have been forced to look within as a result of trade and border closures. There is an opportunity to integrate these policies as well as re-define current STI policies to be more responsive to the needs of the people, not only in technical and economic sense, but also in a social sense and in a manner that informs inclusive risk management policies and development pathways.

4.3.4. COVID-19 has demonstrated the need for better integration of science-policy interphase through sustained dialogues and consensus beyond commonly deployed traditional policy dialogues

Science policy advisory systems have supported co-creation of solutions to respond to the pandemic. Some of the proposed solutions to the policy makers by scientists have worked while some have not. Also, some of the decisions policy makers have taken to respond to the pandemic (not informed by scientific evidence) have worked while some have not.

Where the science policy interface has not worked, we have seen the politicization of scientific evidence. The science advisory services experience within the UK system highlights extreme ends of failure and success. Being a well-established system with science advisors, the UK has supported policy pronouncements in efforts to contain the virus.

The response approach was initially modelled around using epidemiology and virologists to work on models which failed due to insufficient data. Therefore, where evidence failed to materialize, blame was passed between scientists and the politicians, again “politicizing science”. Siloed approaches to solutions again meant that more important stakeholders were ignored in the process.

There is therefore a need to balance the politicization of science to better develop instrumental response. Learning from this situation, there is a need for iterative thinking and communication between scientists and policymakers, between scientists and the public, and between the government and the public. This will support openness and transparency in decision-making including a

buy-in from the public on risk management.

4.3.5. Integrating South-South collaborations through science systems

From the discussions, it emerged that South-South collaborations need to be integrated through science systems. What COVID-19 has holistically revealed to us is that local events do not exist in isolation. Local events influence global events and global events influence local events.

What this implies is that stakeholders in different domains of knowledge need to find ways of working together. While international collaboration is supported, more often than not it is only seen as global North-South collaboration to address Global South issues. However, Africa's diversity and richness of knowledge and resources is a good breeding ground to continue more intra-African collaboration.

The pattern and the intensity of intra-African collaboration compared collaboration with other parts of the world is wanting. Supporting post COVID-19 recovery and lessons will entail supporting more pan-African enterprises funded by African states and the efficiencies of scale scientists working together and exploiting resources.

4.3.7. COVID-19 has reinforced the need to rebuild beyond science-policy interface and strengthen practice and implementation

Science is not the only driver of political decisions, a fact that emphasizes the need to build the interface between science, policy, and practice. For a long time, Africa has championed a narrative around science as a tool for informing policies but with little attention to whether these policies are effectively implemented or not. The COVID-19 experience has exposed deficits in most of the existing policies which were unable to address the pandemic, forcing most countries to rely on emergency directives and formation of ad-hoc committees.

There is need to shift the discussion around science-policy interface from evidence-based policies and research-policy uptake etc. to strategic niches that enable the development of effective policies as well as catalyze their implementation. The role of innovations witnessed during the pandemic in bridging the gap between the science-policy and practices was underscored. Both technical and social innovations such as locally made kits, face masks, handwashing machines etc. were key areas where ideas were translated into practice. Research evidence could be better designed and applied to support

such innovations as a means to strengthening practice.

This suggested way of rebuilding science-policy and practice is underscored by UNDESA, (2020) which emphasizes the need to go beyond science and policy to more inclusive approaches while addressing the voices of marginalized communities. Developing these interfaces is not a linear process as such scientists need to understand the diverse pressures to deliver timely solutions while politicians have to understand that science advice can never be completely certain. These stakeholders individually and collectively should strive to engage more with the society to develop more holistic solutions validated by the people the policies and solutions are developed for to enhance accountability and public trust (Balvanera *et al.*, 2020; Leach *et al.*, 2020).

4.3.8. STI indicators as a means to enhancing surveillance of STI systems for risk management

The need for understanding trends and uncertainties and how best STI systems can enable such an understanding emerged strongly from the discussions and previous preparatory seminars. Part of the deliberations during the seminar centered on ways in which STI informs trends that could be used to interpret development progress and risks. Indicators are key to informing trends and pointing to the relevant data to define these trends. More specifically, the need for STI based indicators for Africa was underscored as an opportunity towards understanding risk better even though the continent still lacks clear-cut set of applicable indicators.

The AUDA-NEPAD has supported the development of STI indicators in a number of African countries. The agency coordinates the African Science Technology and Innovation Indicators (ASTII) initiative that started with only 19 countries and increased to 33 countries in the year 2014. While many countries are supported in the collecting of Research & Development (R&D) data, the progress has been slow with only 23 countries submitting their R&D data. Again, the data submitted by countries is largely input-based, focusing on the number of people trained on particular topics, the number of technical training centers etc.

While this data is useful, it does not show how these investments are leading to better solutions to the societal problems such as the COVID-19. Consequently, most countries have not been able to connect their R&D investments to development and risk management. Discussions thus noted

that building more inclusive and process-oriented R&D indicators that capture both inputs, outputs, and trends could be useful in projecting trends and managing uncertainties associated with risks such as the COVID-19.

It was nonetheless acknowledged that there is a growing interest among African countries to conduct surveys and collect data on STI indicators not only to inform policy making in the continent but also to catalyze innovative solutions to societal challenges such as COVID-19 and other disasters, poverty, gender imbalances etc.

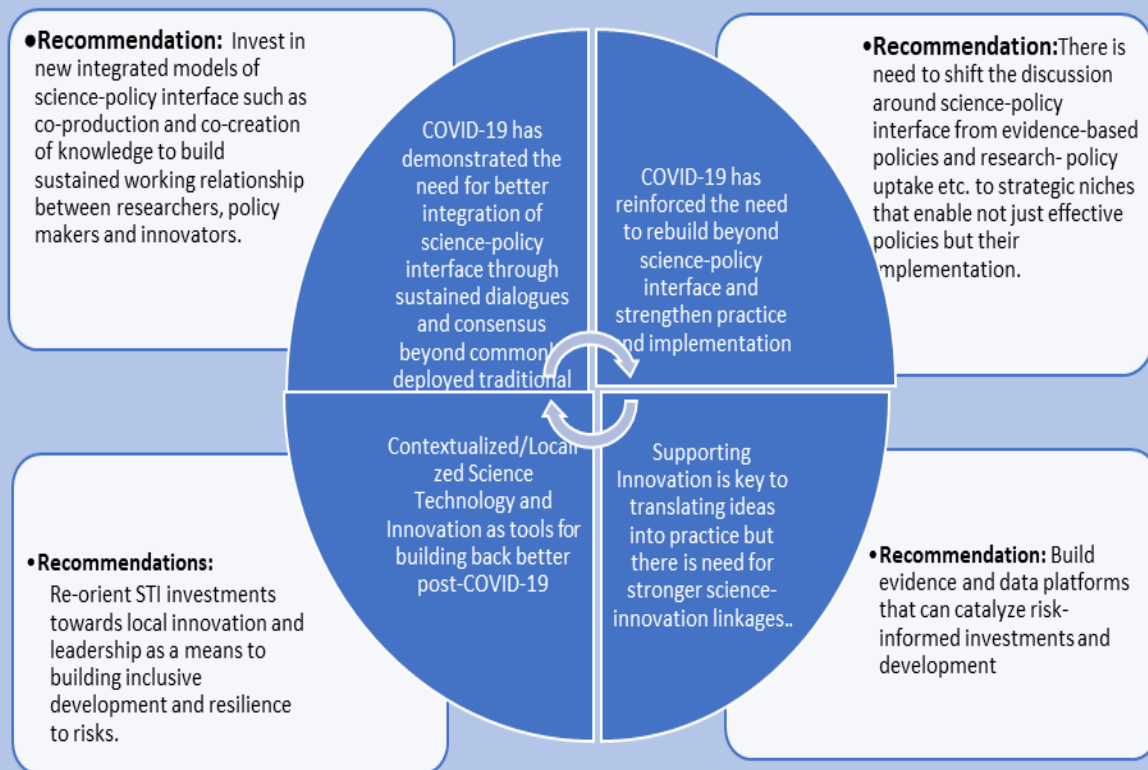
The experience however demonstrates that building relevant STI indicators is a continuous process that requires having the right and timely evidence on what works, the policy formulation process, and financial resources. There were nonetheless concerns that despite a huge amount of evidence generated by researchers both from within and outside the continent, the uptake of this evidence into policy and implementation is weak and subject to complex political processes. It was therefore stressed that researchers should understand the dynamics of the decision-making processes such timeliness, political negotiations and consensus building, practical impacts, among others. Timeliness, for example, in the case of COVID-19 suggest that evidence is more useful in times of crisis. But is this a sustainable trend?

4.3 Summary and conclusions

There is considerable progress that has been made in African countries to achieve the Science Technology Innovation Strategy for Africa-2024 and the African Union agenda 2063. The COVID-19 pandemic may erode these gains or accelerate their achievements if lessons can be harnessed and solutions explored by various research and policy domains. Science technology and Innovation have again proven to be pivotal in the recovery efforts through providing pandemic surveillance systems as well as opening up opportunities for understanding and appreciating the value of local and solution-oriented innovations alongside global competitiveness.

The STI & COVID-19 dialogue further demonstrates that there is a huge opportunity to rethink the STI processes and to understand what is relevant for Africa as a continent. Supporting locally driven innovations, promoting evidence driven consensus in decision processes, and strengthening and profiling locally driven innovations alongside co-created evidence and decision support platforms, are opportunities that countries can build on to re-define the ways in which they build their STI systems as developmental and risk

management tools. Stakeholders called for the need to see how the indicators e.g., R&D surveys can be translated into development targets that can inform risk management.



5. OVERALL SYNTHESIS & RECOMMENDATIONS

From the foregoing findings, four overarching areas will require consideration in building Africa's resilience post-COVID:

- i. **Post COVID-19 Policy Review:** Overall, the COVID-19 has exposed the public policy challenges and deficits that Africa faces in light of the dynamic nature of risks. Risks are becoming not only more uncertain but also more acute and complex. The COVID-19 is largely a public health challenge but has, in addition, exacerbated other major public policy challenges such as socio-economic inequalities, alongside creating new frontiers of poverty and vulnerability, among others. While the COVID-19 is in many ways a stark illustration of the characteristic nature of 21st century problems, policy re-orientation to account for this uncertainty is needed.
- ii. **Strengthening domestic systems:** Across the three themes of the conference, the value of domestic systems has been stressed, ranging from local and subnational climate action (under the Climate theme), local innovations (under the STI theme) and community/locally driven disaster management solutions (under the Cities theme). Following the resultant global lockdowns and reduced importation and exportation of goods during the pandemic, most countries have had to depend on their locally available innovations and engagements to combat the situation. These locally driven innovations have multiple benefits such as: learning models through which multiple societal problems such as climate change and disasters can be addressed; promoting pro-poor action and responding to the context specific nature of impacts brought by global challenges such as the COVID-19; developing local innovation leadership for bottom-up policy and agenda setting. The potential for building local systems can be guided through broader narrative change and a shift from viewing innovations through broader conceptual lenses and framing around global competitiveness, and intentional support of these local systems through science and policy.
- iii. **Building leadership in the global South:** The COVID-19 pandemic has revealed that African countries are capable of taking leadership and tackling their domestic and international challenges. Strengthening leadership in the global South is key to promoting homegrown solutions

and ensuring that policy approaches on STI, Climate change or building resilient tomorrow's cities are aligned to the circumstances and realities of context. Building home-grown leadership and capabilities to tackle such challenges is likely to reinforce the development of effective policies that are aligned to the needs and circumstances of the continent. This is however not to say that partners from outside Africa are not valuable, but the African continent can engage better with the Northern and other Southern partners if it is organized and with a clear agenda that is aligned to the continent's priorities. This certainly calls for investments that will support such re-organization and positioning.

- iv. **Evidence and data platforms:** Understanding global trends and uncertainties of risks is largely dependent on continuous research, generation of evidence, and management of data to help predict and inform foresight policies. Global challenges are becoming more complex, and this requires a clear understanding of the processes and interlinkages as well as the trends associated with these challenges. It is however worth noting that generating evidence and data is simply not enough to spur policy or culture change at the wake of uncertain events. The usability of the evidence and data is thus critical given the huge amount of data that exists but has not been utilized for relevant policy interventions. Moving forward, African governments need to invest more in developing data and evidence management platforms that could provide reliable and sustained surveillance systems, and projections of potential risks and future pandemics.

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ANNEXES

1. Conference Programme: (Click [here](#))

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