Entrepreneurial responses

to Covid-19 in Africa

Maud van Merriënboer (Ed.)

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Eburon

Utrecht 2022

ISBN 978-94-6301-432-8

Eburon Academic Publishers, Utrecht, The Netherlands
www.eburon.nl

Cover design: Textcetera, The Hague
Graphic design: Studio Iris, Leende

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Acknowledgements

I would like to express my deepest appreciation to the members of the NVAS board for giving me the opportunity to organise the 2021 Africa Day and further explore the topic of entrepreneurship in Africa; Azeb Amha, Jan Jansen, Iva Peša and Karin Willemse. I had the pleasure of collaborating with Jan Jansen in compiling this edited volume and learned a lot from him. Finally, many thanks to my PhD supervisor Enno Masurel (Vrije Universiteit, Amsterdam) for providing feedback on earlier versions of the Introduction.

Maud van Merriënboer,
October 2022

Introduction

Entrepreneurial Responses to Covid-19 in Africa

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NVAS and Covid-19 in Africa

Since advent of Covid-19 the world has been captivated by vaccines, conspiracy theories, mouth masks, and hand sanitizers. Social and economic life has been severely affected in every part of the world. Like many academic and public institutions, the Dutch Association of African Studies, hereafter "NVAS" (Nederlandse Vereniging voor Afrika Studies), was forced to move activities online and rethink its institutional role in the context of a global crisis. At the same time, the NVAS board and members grew concerned and unsure about the impact of the global pandemic in Africa, about which a lot is still unclear. Many of our (board) members regularly spend time in Africa both to conduct research and for personal reasons. Due to lockdowns and travel restrictions, however, our members were unable to make professional or personal trips to Africa and instead needed to rely on messages from colleagues, friends, and family to try and understand the situation on the ground.

Being unsatisfied with the limited and inaccurate reporting by Western media of the impact the pandemic has had in Africa, and in line with our mission to build bridges between the community of Africa scholars and a broader audience in the Netherlands, the NVAS aimed to increase awareness about the pandemic in Africa with our membership. To do so, we focused on Covid-19 during the annual NVAS Africa Days in 2020 and 2021. We organised our first virtual Africa Day on 31 October 2020 and invited five speakers from different Sub-Saharan African countries, namely Setargew Kenaw (Ethiopia), Samuel Ntewusu (Ghana), Mariama Mary Fall (Senegal), Kobie Jacobs (South Africa), and Abdallah Ally (Tanzania),

to share their personal and professional experiences with the Covid-19 pandemic and its consequences as it pertained to social and public life. Their stories were very informative and at the same time deeply personal. We learned about the difference in timelines and measurements between countries as well as the difficulties our speakers encountered as they navigated not only lockdowns and travel restrictions, but also misinformation and slow institutional responses.

A recurring theme in their stories was how the Covid-19 pandemic disproportionally affected poorer communities; students who were unable to follow lectures or classes online because they did not have access to internet, for instance, or street hawkers unable to work due to lockdowns and curfews. The speakers also shared their own experiences with the pandemic. Since many of them were either students themselves or were active in the education sector, they had experienced restrictions in academic research or had been forced to work from home and offer or follow online lectures and classes. The mental and psychological consequences of the pandemic were also discussed, such as the loss of close relatives due to the virus and panic attacks caused by widespread non-compliance with preventive measures. Yet, through the diversity in their stories it also became clear that the impact of the pandemic and subsequent interventions has been very different throughout the continent. Therefore, we cannot speak of a collective African experience as it pertains to the Covid-19 pandemic (Faloyin 2022).

In 2021, NVAS zoomed in on the role of entrepreneurship and entrepreneurs in navigating the Covid-19 pandemic in Africa. On 16 October, scholars and practitioners from the Netherlands and Africa came together in a virtual environment to discuss entrepreneurial responses to Covid-19 in Africa. A selection of the research presentations is now published in this volume. After two panels, the conference day was closed with an online showing of a short documentary of anthropologist and filmmaker Laura Molsbergen about the lives of dancers from Arusha, Tanzania, and ways in which the Covid-19 pandemic affected their livelihoods.

An important insight developed during the conference day is that the global pandemic negatively affected entrepreneurs in many ways, while also seemingly working as a driver of innovation and growth. We delve deeper into these seemingly contrasting perspectives in the next section.

Entrepreneurship and Covid-19 in Africa: Necessity or Opportunity?

Globally, small and medium enterprises (SME) entrepreneurs were hit hard by the Covid-19 pandemic and subsequent measures such as lockdowns and market closures. Africa was no exception. Although the economic impact of the pandemic differs greatly both between and within countries, the pandemic and measures employed to contain its spread have taken their toll. Due to Africa's reliance on the global supply chain and the drying up of external financial flows, African economies suffered a lot, disparately impacting SME-dominant sectors such as tourism, trade, and service industries. Entrepreneurial intentions and activities were expected to have a broad downturn due to substantial risks on both demand and supply side (OECD 2020; Okuwhere and Tafamel 2022; Meunier *et al.* 2022), with established entrepreneurs being forced to downsize or quit their businesses, while fewer novel entrepreneurs entered the market and started their own companies. At the same time, entrepreneurship is considered one of few viable options to ensure an income during uncertain economic times, meaning an increase of necessity entrepreneurship was also expected.

Furthermore, it has been argued that "entrepreneurship as a socio-economic activity provides a way for society to recover from the crisis" (Ratten 2020: 6). That is, the crisis may drive innovation and technological advancements globally, and perhaps even more so in Africa due to its young demographic (Ighobor 2020). Indeed, innovations in the realm of healthcare, education, and social protection have proliferated across the continent (Oppong *et al.* 2021). According to a World Health Organization Africa study, 12.8 percent of technologies developed globally in response to the pandemic were developed in Africa (WHO 2020). Entrepreneurs can be seen as agents of change that help to "build back better," and a crisis such as Covid-19 causes people to turn to entrepreneurship to solve new problems and entrepreneurs to come up with innovative responses to the crisis (Namatovu and Larsen 2020; Andersen 2020).

As a response to these conflicting perspectives on entrepreneurial responses to Covid-19 in Africa, the current volume focuses broadly on answering two questions. The first two chapters pertain to the question of whether the Covid-19 pandemic and its broader consequences increase entrepreneurial intentions. Is entrepreneurship a pathway out of the crisis for individuals, providing an income and financial stability in a stressed labour

market? Or have individuals turned away from entrepreneurship due to the risk and a lack of start-up funds and subsequent investments? The last two chapters contrastingly consider how the Covid-19 pandemic spurred entrepreneurial resilience and innovation. The cases presented in these chapters show that as a result of entrepreneurial resilience – "the ability of an entrepreneur to manage difficult personal and market conditions as well as destabilising events, and be future-oriented" (Fatoki 2018: 3) – the adverse effects of the Covid-19 pandemic ignited entrepreneurial innovation in terms of new products, markets, and strategies.

As the organising member on behalf of the NVAS board, I am delighted to see the diversity in methodologies, contexts, and themes in the contributions to this edited volume. Methodological approaches include survey research (Chapter One by Hanaâ Benchrifa and Steven Kator Iorfa), ethnographic fieldwork (Chapter Two by Magnus Godvik Ekeland), interview-based work (Chapter Three by Lotte-Marie Brouwer), and case study research (Chapter Four by Neema Komba and Chanyoung Park). Furthermore, the volume includes studies that cover diverse areas of the African continent, namely: South Africa, Morocco, Kenya, and Tanzania. The studies discuss entrepreneurial concepts such as intentions, motivations, and resilience as well as broader social science themes such as personhood, fear, and gender.

Finally, the NVAS board is proud to provide space specifically to PhD candidates and early-career scholars from both the Netherlands as well as Africa to showcase and publish their work. The following section introduces the chapters of this volume.

The Contributions in this Volume

In Chapter One, Benchrifa and Iorfa use survey research to study the entrepreneurial intentions of Moroccan university students. They find that negative perceptions of Covid-19 are positively related to entrepreneurial attitudes, subjective norms, and behavioural control. This means that students who due to the lockdown and subsequent scarcity of resources felt threatened about their future, have a more positive attitude towards entrepreneurship and entrepreneurial activities. This relationship is moderated by coping skills (those who are better in coping have less entrepreneurial attitudes) and proactive behaviour (those who are more proactive have less entrepreneurial attitudes). The authors argue that students who have lower degrees of coping skills and pro-active behaviours are more inclined to

develop entrepreneurial attitudes from the perspective of necessity entrepreneurship – the uncertainty surrounding their futures makes entrepreneurship the only viable option.

Taking a very different approach, Ekeland (Chapter Two) conducted extensive ethnographic fieldwork in a South African township to understand the potentiality of increasing entrepreneurial intentions via a Basic Income Grant (BIG). Through in-depth ethnographic accounts we gain an insight into the lives of young residents and how the Covid-19 pandemic and subsequent measurements have impacted their lives and livelihoods. Based on conversations with unemployed youngsters and observations on how they spend a temporary Covid-19 grant (which is recognised as a predecessor of the BIG), Ekeland explains that entrepreneurial intentions are not likely to increase due to contextualised perceptions of personhood and values of exchange, such as the fear of relational dependence on (female) relatives.

Brouwer (Chapter Three) introduces a different perspective. She followed twenty cases of Kenyan female agri-entrepreneurs to understand how the pandemic impacted their businesses and their subsequent response strategies. Whilst identifying many negative effects the lockdown measurements had on their business – such as increased costs and decreased productivity – Brouwer also recognised several strategies of *adaptive resilience* the female entrepreneurs employed to negate the downfalls of the Covid-19 pandemic. She analysed both short-term strategies such as reducing costs and working side jobs, as well as long-term adaptation strategies such as changing target markets and implementing digital solutions. Exemplary is the case of Mercy Mwende, an agri-business woman who, as export numbers declined, developed a new product (affordable porridge) to appeal to local community and diminish dependence on external markets.

Similarly, Komba and Park (Chapter Four) engage with literature on entrepreneurial resilience to showcase how the Covid-19 pandemic triggered innovation in East Africa. Writing on two cases of medical innovation from Kenya and Tanzania (a low-cost mechanical ventilator from Kenya and an herbal tonic for steam inhalation from Tanzania), Komba and Park argue that the Covid-19 pandemic triggers different kinds of innovation. The Kenyan Tiba-Vent is exemplary of *collective* and *targeted* innovation with a lengthy adoption process due to low policy support. Contrastingly, the Tanzanian Cubic Bupiji Sauna can be considered a *top-down* and *repurposed* innovation with a short adoption process because it received strong

policy support. All in all, Komba and Park find that entrepreneurship at the face of a crisis helps communities cope with the threats of a crisis whilst at the same time highlighting the importance of peer support and institutional support to foster such innovative entrepreneurial responses.

Together, these studies provide a cross-sectional and cross-methodological anthology of entrepreneurial responses to Covid-19 in Africa. To be sure, I do not argue that this collection provides the reader with a holistic or complete base of knowledge on entrepreneurial responses to Covid-19 in Africa. Despite their incompleteness, the upcoming chapters provide novel and interesting insights on the role of entrepreneurship and entrepreneurial responses during the Covid-19 pandemic that urge us to continue to think about how different crises affect entrepreneurship (and vice versa) in Africa, and elsewhere.

Furthermore, the contributions in this volume are not only theoretically revealing, but are also relevant for non-academic audiences. This not in the least because our sample of authors has diverse backgrounds. Whilst all of them are academically embedded and affiliated with different universities, they also showcase relevant practical experience that allows them to offer a practice-based insights into our themes. Lotte-Marie Brouwer (Chapter Three) for example has worked extensively with women entrepreneurs in her role as project manager at Bopinc, a global business development organisation targeting low-income consumers. Similarly, Hanaâ Benchrifa and Stephen Kator Iorfa (Chapter One) not only research entrepreneurship education but are also heavily involved in designing effective entrepreneurship programmes at their respective universities in Morocco and Nigeria.

Based on this expertise, this edited volume offers useful advice and actionable tips for practitioners in the field of education, entrepreneurship training, and regional development. Benchrifa and Iorfa's work highlights the importance of considering differences in motives to pursue entrepreneurship; to seek out opportunity or to prevent unemployment. Their insights have the potential to help entrepreneurship educators in developing programs and supporting their students. Ekeland's work on the proposed Basic Income Grant offers useful insights into how township residents make sense of and intent to use the provisional grant which South African policy makers can use in their planning. The insights on entrepreneurial resilience offered by Brouwer and by Komba and Park are highly relevant for practitioners working in entrepreneurship development. As both authors

show how entrepreneurial resilience yields creative and innovative solutions in times of crisis, furthering our understanding of how to enhance entrepreneurial resilience through institutional support or training programmes would be an interesting future pathway.

The NVAS aims to facilitate and improve interdisciplinary contact between Africa scholars and share knowledge and research on Africa with a broader audience in the Netherlands. We therefore opted to compile an edited volume that is useful and relevant for anyone who is interested in entrepreneurship in Africa and the consequences of the Covid-19 pandemic on the continent. Whether a crisis such as the Covid-19 pandemic diminishes opportunity entrepreneurship and is only a viable option for those that lack secure employment options, or it functions as a catalysator that ignites entrepreneurial resilience resulting in innovative entrepreneurial solutions, is a question that remains unanswered. Perhaps both are the case, and a downturn of entrepreneurial activity exists simultaneously with new, innovative entrepreneurial solutions that play an important role in society's navigation out of a crisis. In any case, we hope this volume shows to the importance of considering how entrepreneurs respond to global crises and how their responses (or lack thereof) can affect many spheres of public life in Africa.

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Chapter One

Entrepreneurial Intentions among Moroccan University Students in Times of Crisis: A Focus on the Impact of the Covid-19 Pandemic

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Abstract

The year 2020 will be forever associated with the Covid-19 pandemic. This health crisis disrupted global interactions with countries closing borders and regions being locked down. In Morocco, according to HCP (Higher Planning Commission), 57% of all companies have stopped their activities. The most affected sectors are the hospitality industry with 89% of companies shut down, the textile industry with 76%, leather industries with 73% and the construction industry with 60%. With the unprecedented nature of the pandemic, it is unclear what its impact on entrepreneurship and entrepreneurial intentions would be. Research has shown that crisis may have a two-edged impact on entrepreneurial intentions. On one hand, crisis may motivate individuals to defend their financial and social status through supporting their entrepreneurial intentions while on the other hand, crisis may limit the available financial resources and negatively impact the psychological and mental states necessary for entrepreneurial intentions to thrive.

The purpose of this study therefore is to investigate the impact of a socio-economic crisis (with a high level of uncertainty as the Covid-19 pandemic) on the entrepreneurial intentions of young people (university students). The paper provides insights about drivers and barriers that affect the intentions of becoming an entrepreneur. Based on the theory of planned

behavior and social cognitive theory, we adopt a quantitative cross-sectional methodology using a survey of university students in Morocco which allows us to analyze whether the crisis had a positive or negative effect on entrepreneurial intentions of Moroccan students.

Findings showed that negative perceptions about Covid-19 positively associated with entrepreneurial attitudes, subjective norms and behavioral control. The ability to cope with Covid-19 moderated the association of Covid-19 perception and entrepreneurial intentions such that students who had negative perceptions about Covid-19 but could cope well had less entrepreneurial intentions. Proactive behavior also moderated the association of Covid-19 perception and entrepreneurial intentions suggesting that having negative perceptions about Covid-19 and being highly proactive led to less entrepreneurial intentions. These findings were discussed along implications for future research and policy implementation.

Introduction

Emergency situations such as natural disasters and pandemics often come along with unprecedented hardships for individuals. These hardships come in the form of disruptions to economic activities as well as lifestyles. The Covid-19 pandemic is an example of a global health emergency which brought disruptions to economic activities as well as lifestyles. Governments all over the world responded to the pandemic by shutting down and declaring lockdowns/quarantines which for most countries lasted into months. In Morocco, these lockdowns posed a great threat to the economy such that they were relaxed after three months (OECD 2020) in order to revitalize the economy. The impact on individual businesses may not have been properly documented but reports show that due to the stay-at-home policy, most businesses experienced great threats (Abouzzohour 2020) while some may have completely shut down (Nachit and Belhcen 2020) before the end of the lockdowns. Coupled with the distress of the pandemic, the crumbling of businesses during the pandemic crises may have influences on entrepreneurial intentions in ways that have not been observed before. For instance, it is unclear if the difficulties encountered during the lockdowns would further challenge individuals to start their own businesses or whether they would further inhibit their intentions to start new businesses. As it is with every crisis, some persons see challenges while others see opportunities.

Previous studies outside the context of a crisis have shown that environmental, psychological and social factors interact in shaping entrepreneurial intentions during crisis (Linan 2008; Liguori 2018; Nguyen 2019). Our survey therefore was conducted to investigate if these factors will yield the same patterns of associations with entrepreneurial intentions among students in the context of a crisis. Our survey provides imminent answers to the following research questions: what is the impact of Covid-19 crisis on entrepreneurial development, particularly entrepreneurial intention? What are the factors that can reconcile the relationship between Covid-19 pandemic perception and entrepreneurial intention? To answer these questions, a quantitative survey using an online questionnaire for Moroccan university students was conducted. This paper is organized as follows: a brief presentation about the context of the survey and the situation of Covid-19 pandemic in Morocco, a literature review providing a theoretical framework about entrepreneurial intention during crisis, the research methodology and then a discussion of the results.

Research Context

Yildirim, Akgül and Geçer (2021) reported that the Covid-19 pandemic, coupled with the strict measures taken to curb its spread were responsible for creating an atmosphere of anxiety, fear, uncertainty and insecurity. Feng *et al.* (2020) also confirmed that fear and anxiety were fast growing among individuals during the pandemic lockdowns. Besides the negative impact on mental and physical health (mortality and morbidity), all the restrictions taken by countries in order to limit the spread of the infection have slowed global economic activities and disrupted global financial markets (McKibbin and Fernando 2020; Morgan *et al.* 2021).

Morocco, like many countries in the world, was not safe from the spread of coronavirus. In order to limit the rapid spread of the virus therefore, several stringent and quarantine measures were taken, including curfews. From March 2020 until the time of writing this article, 929,305 Coronavirus cases had been confirmed with 14,167 deaths recorded.

Regarding its impacts on economic activities, the Higher Planning Committee (HPC[1]) reported that 57% of all companies have stopped their activities. The most affected sectors being the hospitality industry with 89% of companies being shut down, the textile industry with 76%, leather industries with 73% and the construction industry with 60%. 27% of companies had to temporarily or permanently reduce their workforce.

Thus, according to the survey results 20% of the workforce had been reduced. Ali *et al.* (2020) agree on the magnitude of the Covid-19 crisis and reveal a severe contraction of economic activity of nearly 7% mainly due to containment measures and the drastic decline in foreign demand.

Entrepreneurial Intention in a Crisis Context: Entrepreneurial Intention

Entrepreneurial intention is the fundamental element in the business creation process. It is the "target behavior of starting a business" (Kruger 1993: 6). Entrepreneurial intention is a commitment to starting a new business and making the choice to change from unemployment or salaried employment to self-employment (*ibid.*). Nabil and Zhang (2020: 197) described this phenomenon as complex and defined it as "the intention of a person to start a new business venture for the main purpose of profit seeking at some point in the future."

Studies in entrepreneurial intention are generally based on three psychological theories: the entrepreneurial event model (EEM, Shapero and Sokol 1982), Ajzen's theory of planned behavior (Ajzen 1991) and Bandura's social cognitive theory (Bandura 1991). These theories offer a coherent, simple and robust framework to better understand the business creation process regardless of the context.

Entrepreneurship and Crisis: Literature Review

Doern *et al.* (2019: 401) defined crisis as "an extreme, unexpected or unpredictable event which requires an urgent response from organizations and creates challenges for them-by interfering with its operations, creating ambiguity in its decision- making processes, threatening its goals and values, damaging its public image and bottom line." In addition, the high level of uncertainty and insecurity which comes along with crises (such as wars, terrorist attacks, natural disasters, economic recessions and pandemics) presents different challenges for individuals and for countries in general. They may influence the expectations and perceptions of the individuals on one hand and decrease investments and the Gross Domestic Product of countries on the other hand.

Previous studies found that the conditions of economic environment in which the new organization will operate is a relevant factor to make the decision to start a new business and to explain the entrepreneurial intent (Dubini 1988; Luthje *et al.* 2003; Arrighetti *et al.* 2016). In Table 1, we

provide a review of seven studies on entrepreneurial intentions in the context of crises. Results revealed two categories of crises context: war/terrorism and economic recession conditions.

Mouselli and Kahlifa (2017) investigated the factors that affect entrepreneurial intentions of university students during the period the Syrian war lasted. They found that entrepreneurial intentions in Syrian students were optimal during the wars due to individual levels of self-efficacy. In contrast however, Nabil and Zhang (2020a; 2022b) found that the Syrian and Yemen crises had significant negative impacts on individuals' entrepreneurial intentions.

The second category of findings explored entrepreneurial intentions strictly in terms of economic crises. Giotopoulos *et al.* (2017) studied potential drivers of high entrepreneurial intentions of early stages entrepreneurs in Greece before and after the severe economic and financial crisis of 2009. They observed that during the crisis, male entrepreneurs and entrepreneurs with significant work experience were more committed to growth-oriented entrepreneurship and that opportunity perceptions was an important driver of growth-oriented entrepreneurship.

Arrighetti *et al.* (2016) found that negative perceptions of the economic crisis in Italy was a barrier to entrepreneurial intentions. Santos *et al.* (2017) analyzed the impact of individual characteristics and social norms on entrepreneurial activity before (2007), during (2010) and after (2012-2013) the European crisis. They found that individual characteristics such as self-efficacy, perceptions of opportunities, role mode and risk perceptions remain the main predictors of entrepreneurial activity.

In sum, the impact of the crises on entrepreneurial intention is very diverse as previous studies have returned mixed findings. We also observed the importance of the interaction of environmental, psychological and social factors in determining the entrepreneurial intention during crisis. Nabil and Zhang (2020a) confirmed that there is a set of interacting factors such as types of crisis, a decline in economic opportunities, as well as the degree of uncertainty and insecurity which influence entrepreneurial intentions.

Table 1: Main studies on entrepreneurial intention during crises

Survey	Context	Sample	Theory	Main findings
Bullough *et al.* (2014)	Afghanistan: War and terrorism settings	272 Afghan male and female professionals in the working community	Social cognitive theory (Bandura 1986; Wood and Bandura 1989)	• Significant impact of perceived danger on entrepreneurial intention • Resilience is positively related to entrepreneurial decisions under challenging circumstances • Resilience and self-efficacy reinforce one another to affect entrepreneurial intention
Arrighetti *et al.* (2016)	Economic crisis during 2008-2010	3684 Italian University students enrolled in twelve different faculties	Pruett *et al.* (2009)	• Significant impact of the perception of economic crisis on the likelihood to start a business
Giotopoulos *et al.* (2017)	Greek economic crisis	Individual level data retrieved from Global Entrepreneurship Monitor annual reports (2003-2015)	Theory of planned behavior and GEM conceptual framework (Levie and Autio 2008; Reynolds *et al.* 2005)	• Growth entrepreneurship in Greece is driven by different factors in the crisis period comparing to the non-crisis period • Significant impact of gender effect and work experience on entrepreneurs' high growth intentions • Negative impact of necessity motives on entrepreneurs' high growth intentions • Opportunity perceptions are the key driver of growth-oriented entrepreneurship in adverse economic conditions • Educational attainment of entrepreneurs appears to be an important driver of growth-oriented entrepreneurship only in the pre-crisis period • Insignificant impact of educational level and social contacts of founders with other entrepreneurs after the crisis, while they were a drive to Greek entrepreneurship before the crisis
Mouselli and Khalifa (2017)	Syrian War	183 Syrian University students	Davidsson's model (1995) Kruger (2009) and a number of socio cultural factors suggested by Entrepreneurial event model of Shapero (1982), Theory of planned behavior (Ajzen 1991),	• Higher entrepreneurial intentions for Informatics and Communication Engineering and for male students. • Significant impact of self-efficacy, information and communication, institutional environment on entrepreneurial intention • Insignificant impact of crisis effect on entrepreneurial intentions

Survey	Context	Sample	Theory	Main findings
Santos *et al.* 2017	European economic crisis	Global Entrepreneur-ship Monitor Adult Population Survey Data from Southern European countries (Greece, Spain, Italy and Portugal) and Northern European countries (Sweden, Norway and Finland) in 2007 2010 2012 and 2013.	Social cognitive theory (Badura 1997)	· Individual factors are the most important predictors of entrepreneurial activity · Absent or low effect of social norms on entrepreneurial activity with slight fluctuations during the crisis · Predictors of entrepreneurial activity are sensitive to time and geographical regions
Nabil and Zhang (2020)	Civil war in Yemen	487 university students	Economic-psychological model (Davidsson 1995)	· No significant difference between gender and entrepreneurial intention · No significant differences in entrepreneurial intentions among students from public and private sector universities · Significant impact of prior entrepreneurial experience and age of respondents on entrepreneurial intention · Significant impact of need for achievement, self-efficacy, locus of control and situational variable (crisis effect) on entrepreneurial intention · No significant impact of instrumental readiness on EI
Almohammed *et al.* (2021)	Syrian refugees in Turkey	122 entrepreneurs	Theory of planned behavior (Ajzen 1991)	· Insignificant impact of psychological characteristics · Self-standards do not affect the entrepreneurial intentions of refugees as support from family and friends

Entrepreneurial Intention and Covid-19: Proposed Research Model

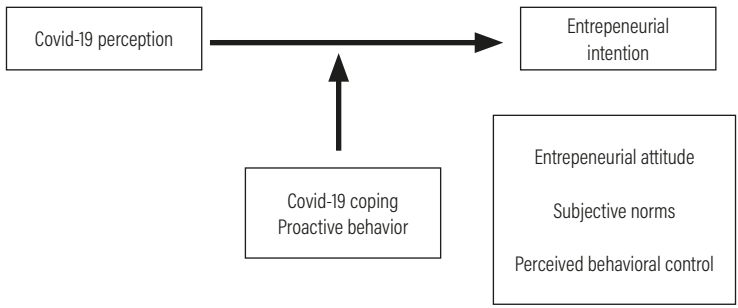
The present research seeks to answer the following questions: What is the impact of Covid-19 crisis on entrepreneurial intentions? What are the trajectories through which negative perception of Covid-19 pandemic influences entrepreneurial intention?

As previous surveys have given more focus on self-efficacy (Huang 2021; Melugbo *et al.* 2020) and resilience (Paredes *et al.* 2021) as mediator variables in the relationship between negative perception of Covid-19 and entrepreneurial intention we judge that it would be better to look forward to study additional factors that may explain this link in the context of Covid-19 pandemic. Hernandez-Sanchez *et al.* (2020) underline the importance of proactive behavior as an additional factor that may impact the Covid-19 pandemic perception and psychological need satisfaction, however, only few studies (Travis and Freeman 2017) had earlier on investigated this assertion.

Coping ability seems to be neglected in understanding entrepreneurial intention in an adverse context. However, coping remains an important factor contributing to the psychological and physical health of individuals (Sim *et al.* 2010; Yildirim 2019). It may reduce the impact of a hard situation, in particular the negative impacts of Covid-19 perception.

Yildrim *et al.* (2021) examined the mediating role of Covid-19 coping strategies on the relationship between Covid-19 anxiety and general health in a representative sample of Turkish population and found out that individuals high in adaptive coping strategies experience less depression, anxiety, stress and greater psychological well-being (*ibid.*). We therefore adopted these two psychological factors (proactivity and coping) as variables in the present study and tested for their moderating influences on the relationship of Covid-19 perception and entrepreneurial intentions. The model in Figure 1 illustrates the proposed study hypotheses.

Figure 1: Proposed study model



Specifically, we hypothesized that:

H1 - The Covid-19 perception will negatively affect entrepreneurial intention
H1a - The Covid-19 perception will negatively affect entrepreneurial attitude
H1b - The Covid-19 perception will negatively affect subjective norms
H1c - The Covid-19 perception will negatively affect perceived behavioral control
H2 - The relationship between Covid-19 perception and entrepreneurial intention is moderated by the Covid-19 coping
H3 - The relationship between Covid-19 perception and entrepreneurial intention is moderated by the proactive behavior

N.B.: Entrepreneurial intention is conceptualized as a latent variable depending on three others: entrepreneurial attitude, subjective norms, perceived behavioral control.

Empirical Survey: Sample and Measures

In order to test our hypotheses, we used a quantitative approach to collect data through a survey of 141 university students in Morocco, composed of 42% men and 58% women. We have chosen this category because it is the most promising population for the development of entrepreneurial supply (Arrighetti *et al.* 2016) and the implementation of social and or environmental projects (Ruiz Rosa *et al.* 2020). Furthermore, university students' reaction is more relevant to the crisis and may have some important policy implications (Arrighetti *et al.* 2016). More than that, entrepreneurial intention of university student is complex and not easy to study (Arrighetti *et al*. 2016; Nabil and Zhang 2020), so we would like to shed some light on this phenomenon in a specific context.

We developed a questionnaire which is structured in three sections, Table 2 states the constructs and the mobilized items in our survey:

(1) The first section focused on entrepreneurial intention and personal behavior: We used the scales proposed by Linan and Chen (2009) to measure entrepreneurial attitude, subjective norms and entrepreneurial intention. To measure perceived behavioral control, we used the six items suggested by Zhao *et al.* (2005). Then, to measure proactive behavior, the items proposed by Bateman and Grant (1993) were used.
(2) The second section is related to Covid-19 perception: As it is a new construct, we used two scales proposed by (Lee *et al.* 2020) and

(Yildirim *et al.* 2021). We used also Yildirim *et al.*'s scale proposition to measure Covid-19 coping.

(3) The last section, we collected data related to gender, age, studies and academic year and perceived economic class.

All the items were measured by a seven point Likert scale regarding the level of agreement (1 = Strongly disagree to 7 = Strongly agree).

Table 2: Construct and associated items

Entrepreneurial attitude
Indicate your level of agreement or disagreement with the importance of the following factors in the decision to start your own business: • Be your own boss • Be free • Be autonomous • Being able to choose your own tasks • Make your dreams come true • Create something new • Put your creativity to work
Subjective norms
If you decided to create a project would people in your close environment approve of that decision: • Your closest family • Your friends • Your study partner
Perceived behavioral control
To what extent do you agree with the following statements regarding your entrepreneurial abilities? • Identify new opportunities • Create new products and services • Apply my personal creativity • Be a leader and communicator • Create a network of professional contacts • Successfully organize/manage a project
Entrepreneurial intention
Indicate your level of agreement with the following statements: • I am ready to do anything to be an entrepreneur • My professional goal is to become an entrepreneur • I will make every effort to start and run my own firm • I am determined to create a firm in the future • I have very seriously thought of starting a firm • I have the firm intention to start a firm someday

Proactive behavior
Indicate your level of agreement or disagreement with the importance of the following factors in the decision to start your own business: • I am happy when I have the opportunity to take on new responsibilities • I am always looking for opportunities to progress • I like to set high goals • I love situations where I have to find solutions to problems • I always try to improve myself from my past performances • I get more satisfaction when I accomplish rather difficult tasks • I like to have frequent feedback on the quality of my work
Covid-19 perception
Indicate your level of agreement or disagreement with the following statements: • The Covid-19 negatively affect my future • The Covid-19 will decrease my job opportunities • The Covid-19 will affect me emotionally (depressed, furious, afraid) • Indicate your level of agreement or disagreement with the following statements: • I feel anxious about my future due to Covid-19 • I feel anxious about my health because of the Covid-19 • I feel anxious to contract Covid-19 • I am preoccupied with anxious thoughts of getting infected to the Covid-19 • I am concerned that the Covid-19 will affect all aspects of my life Indicate your level of agreement or disagreement with the following statements (Lee *et al.* 2020): • I had trouble falling or staying asleep because I was thinking about the coronavirus • I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus • I lost interest in eating when I thought about or was exposed to information about the coronavirus • I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus
Covid-19 coping
Indicate your level of agreement or disagreement with the following statements: • I believe that I have the ability to cope with the Covid-19 • I am able to enjoy my life despite the Covid-19 • I can get through the Covid-19 • I can still focus on the meaning of my life even during the Covid-19.
Seven point Likert scale (1 = Strongly disagree to 7 = Strongly agree)

Empirical Survey: Results

Results of the Hierarchical Multiple Regression analysis in Table 3 showed that the demographic variables (gender, age and perceived income) entered in step 1 of the equation were not significant in predicting entrepreneurial intentions, entrepreneurial attitudes and behavioral control. Gender

however negatively predicted subjective norms ($\beta = .24, p < .01$) indicating that being female gave rise to a 2-unit increase in subjective norms. Negative perceptions about Covid-19 positively predicted entrepreneurship attitudes ($\beta = .38, p < .01$) and subjective norms ($\beta = .28, p < .01$) and behavioral control ($\beta = .27, p < .01$). These positive predictions suggest that for each unit increase in negative perceptions about Covid-19, entrepreneurship attitudes increased by 88 units, subjective norms by 26 units and behavioral by 44 units. The contribution to the variance explained by the models were 16% ($R^2 = .16$) for entrepreneurial attitudes, 17% ($R^2 = .17$) for subjective norms and 12% ($R^2 = .12$) for behavioral control.

Table 3: Hierarchical multiple regression predicting entrepreneurial intentions by Covid-19 perception

	Entrepreneurial intentions											
	Entrepreneurial intentions			Entrepreneurial attitudes			Subjective norms			Behavioral control		
	B	β	T	B	β	t	B	β	t	B	β	t
Gender	.88	.05	.56	2.31	.10	1.27	2.16**	.24**	2.96**	2.44	.16	1.90
Age	.66	.05	.56	-.96	-.06	-.70	.87	.13	1.57	-.47	-.04	-.49
Perceived income	-1.24	-.08	-.09	.21	.01	.14	.64	.09	1.11	-1.06	-.08	-.98
Covid-19 perception	.23	.12	1.46	.88***	.38**	4.80***	.26**	.28**	3.53**	.44**	.27**	3.89**

Note: N = 141, ** = p < .01, *** = p < .001

In Table 4, negative perceptions about Covid-19 (C-19 P) were positively associated with entrepreneurship intentions ($B = 5.51, t = 6.32, p = .00$). This association suggests that for every unit increase in C-19 P, entrepreneurship intentions increased by approximately 5 units. Covid-19 coping (C-19 C) also positively associated with entrepreneurial intentions ($B = 3.73, t = 7.84, p = .00$), suggesting that for every unit increase in coping with Covid-19, entrepreneurship intentions increased by approximately 4 units. The interaction effect of C-19 P and C-19 C was significant ($B = -.23, t = -5.05, p = .00$) showing that coping with Covid-19 moderated the relationship between negative perceptions of the pandemic and entrepreneurial intentions. All the variables in the model explained 46% of the variance observed in entrepreneurial intentions ($R^2 = .46$).

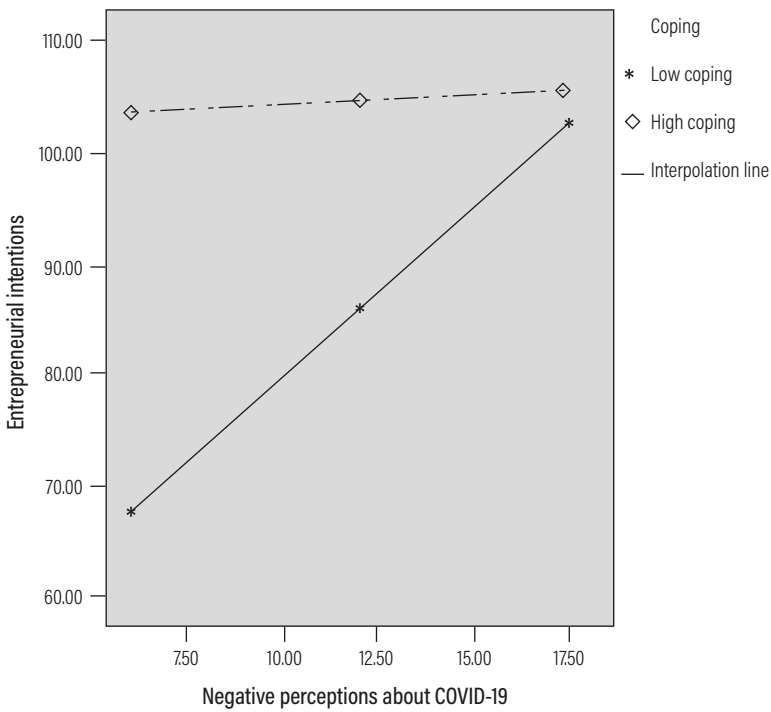
Table 4: Hayes' PROCESS macro results predicting entrepreneurship intentions (entrepreneurship attitudes, subjective norms, and behavioral control), from Covid-19 perceptions and Covid-19 coping

Predictors	Coefficient	*SE*	*t*	P	95% CI
Covid-19 perception (C-19 P)	5.51	.87	6.32	.00	[3.79, 7.23]
Covid-19 coping (C-19 C)	3.73	.48	7.84	.00	[2.79, 4.67]
C-19 P * C-19 C	-.20	.04	-5.05	.00	[-.28, -.13]

Note: Total R^2 = .43, F (3 190) = 46.77, p = .00.

Moderation suggests that the slope of the regression line is different at every value of the moderator. Simple slopes analysis (see Figure 2), revealed that the positive relationship between negative perceptions about Covid-19 and entrepreneurial intentions was not significant for those who had high coping, but was significant and strongest for those with low coping.

Figure 2: Interaction between coping and Covid-19 perception



In Table 5, proactive behavior (Pb) positively associated with entrepreneurial intentions (B = 2.18, t = 9.95, p = .00), suggesting that for every unit increase in proactive behavior, entrepreneurship intentions increased by approximately 2 units. The interaction effect of C-19 P and Pb was significant (B = -.10, t = -4.48, p = .00) showing that proactive behavior moderated the relationship between negative perceptions of the pandemic and entrepreneurial intentions. All the variables in the model explained 63% of the variance observed in entrepreneurial intentions (R^2 = .63).

Table 5: Hayes' PROCESS macro results predicting entrepreneurship intentions (entrepreneurship attitudes, subjective norms and behavioral control), from Covid-19 perceptions and Covid-19 coping

Predictors	Coefficient	*SE*	*t*	P	95% CI
Covid-19 perception (C-19 P)	5.51	.87	6.32	.00	[3.79, 7.23]
Proactive behavior (Pb)	2.18	.22	9.95	.00	[1.75, 2.61]
C-19 P * Pb	-.10	.02	-4.48	.00	[-.14, -.05]

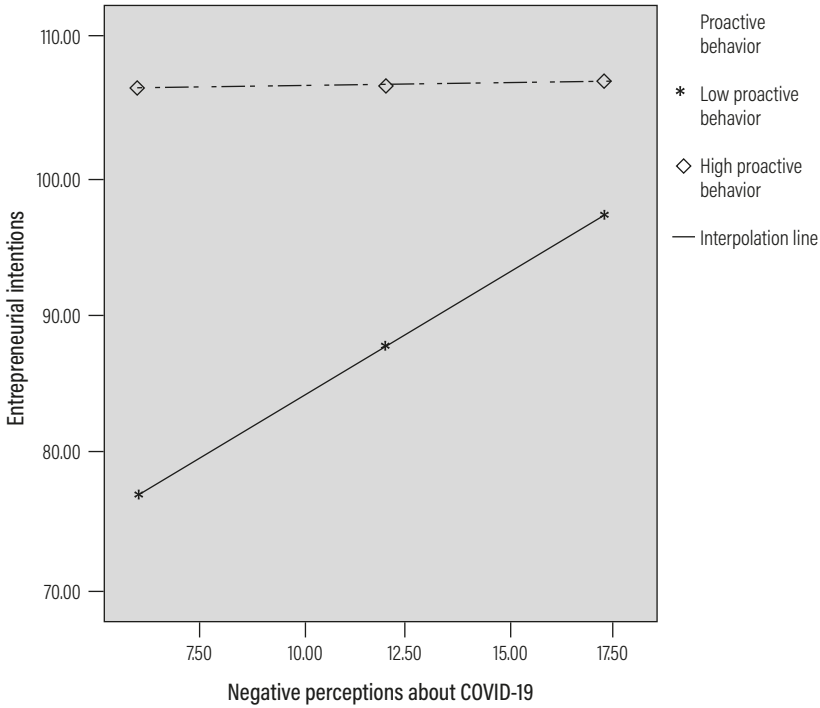
Note: Total R^2 = .43, F (3 190) = 46.77, p = .00.

Simple slopes analysis (see Figure 3), revealed that the positive relationship between negative perceptions about Covid-19 and entrepreneurial intentions was not significant for those who had high proactive behavior, but was significant and strongest for those with low proactive behavior

Discussion

Our paper examined entrepreneurial intentions among Moroccan university students in an uncertain and unstable condition of the Covid-19 pandemic. Our empirical survey highlights that the negative perceptions about Covid-19 positively predicted entrepreneurial attitudes, subjective norms and behavioral control. This means that the more individuals perceived the pandemic as a threat to their future and wellbeing, the more they seemed to hold positive attitudes towards entrepreneurship, the more they felt they would be supported by their friends and family in starting up a project and the more they felt in control and positive about their entrepreneurial abilities. These findings may further be explained from the angle that because respondents negatively perceived the pandemic situation (which means they felt threatened about their future), they seemed to be more positive about their entrepreneurial capabilities. The lockdown

Figure 3: Interaction between proactive behavior and Covid-19 perception



situation and the consequent scarcity of resources and commodities may have engendered positive traits of entrepreneurial intentions in individuals. This finding suggests that post-Covid-19, university students may be better able to develop professional values and vision toward entrepreneurship as a career plan. More than that, these specific living conditions during the pandemic (lockdown, physical distancing, university closure measures, online learning, self-learning and self-training etc.) will strengthen their self-efficacy and self-confidence and they will believe more in their capacities and competencies.

Our results include also that gender positively predicted subjective norms. This means that females (more than their male counterparts) reported that friends and family members were likely to approve of any projected they created. The reason why this may be so is that, females more often receive positive approval much more than their male counterparts (Cavada *et al.* 2018). Also, in times of a pandemic, they are categorized

as more vulnerable than males (Iorfa *et al.* 2020). Thus, it will be easier for friends and family to approve of and subsequently support their entrepreneurial ideas. According to the new development model,[1] Moroccan women have long suffered from low participation and marginalization in the economic life due to the lack of access to institutional opportunities for empowerment and support. In fact, the report indicates a significant women employment rate's deterioration, from 30% in 1999 to 18.6% in 2019. More than, the labor force participation rate for women has decreased from 26.6% in 2008 to 21.8% in 2018.[2] Being conscious of this situation, the new development model considers the participation of women in economic life and gender equality as a fundamental pillars of development in order to achieve an open, cohesive and supportive society. Efforts have been focused on the promotion of women's entrepreneurship, the improvement of access to financing and public aid and a better social protection for women. We cannot ignore the impact of Moroccan culture and social norms on the influence of family members specifically on decision making of women.

Our survey brings a brick to the literature by providing evidence of the moderating role of two narrow measures: coping and proactive behavior. In fact, Covid-19 coping moderated the relationship of negative perceptions about Covid-19 and entrepreneurial intentions in such a way that those who had negative perceptions about the pandemic and low coping abilities scored higher in entrepreneurial intentions than their counterparts who had negative perceptions about the pandemic but high coping abilities. This is because persons who believe they could cope with the situation, may not have seen or felt the need for entrepreneurship. To them, they were doing just fine and there was no push to desire or want more. To better interpret this result, we prefer to take a step back. In fact, university students face two types of career: being a wage earner or being an entrepreneur. Actually in Morocco, educational system focuses on preparing more wage earner than entrepreneur. So, respondents with low proactive

1 The new development model launched in 2019 after the Throne Day speech when The King of Morocco nominated a commission of experts of different fields to explore challenges and seek new solutions. The new model offers a future vision which should serve as the basis for Morocco's future programs by 2035. https://www.csmd.ma/documents/Rapport_General.pdf
https://www.cese.ma/media/2020/10/CESE-Nouv_Modele_de_Devt-f-3.pdf

2 Enquête Nationale sur l'Emploi, HCP 2018.

behavior and coping abilities may choose entrepreneurial career just for necessity, it is just a plan B in order to avoid unemployment and to survive in an uncertain and adverse time (Maritz *et al.* 2020). Literature has already mentioned that the necessity based entrepreneur is the most predominant profile in the context of economic recession (Arrighetti *et al.* 2016; Maritz *et al.* 2020). In fact, we are in front of two different entrepreneur profiles, as they both have an entrepreneurial intention but with different degrees. The category with low coping abilities and low proactive behavior refers to necessity entrepreneur. However, the second category with high coping abilities and proactive behavior refers to opportunity entrepreneur. These two types react differently to crisis and rising unemployment. The perception of crisis reduces both the propensity to start a new business (degree of interest in entrepreneurship) and the perceived likelihood to succeed (probability to start a business), but for necessity based ones, the crisis decreases only the latter (Arrighetti *et al.* 2016). Our result joins perfectly that of Arrighetti *et al.* (2016: 842) who state that: "During periods of economic crisis: the stronger the perception of the economic downturn as a barrier to entrepreneurship, the weaker the students' entrepreneurial intention, such an effect is stronger for opportunity based than for necessity-based potential entrepreneurs." Even if students have high coping abilities and high proactive behavior, they will not adventure in entrepreneurial activity during recession, they will probably use those psychological traits in look forward an opportunity in an existing business. But the second category with low proactive behavior and coping abilities will tend to entrepreneurial activities just because all other alternatives for survival have been eliminated (Maritz *et al.* 2020).

Conclusion and Recommendations

This study, through the proposed theoretical model, provides prominent insights to improve knowledge of the factors affecting entrepreneurial intentions during uncertain situation, as Covid-19 pandemic conditions.

Based on the theory of planned behavior and social cognitive theory, we adopt a quantitative methodology using an online questionnaire for university students in Morocco. Results showed that negative perceptions about Covid-19 positively associated with entrepreneurial attitudes, subjective norms and behavioral control. More than that, the ability to cope with Covid-19 moderated the association of Covid-19 perception and entrepreneurial intentions such that students who had negative perceptions

about Covid-19 but could cope well had less entrepreneurial intentions. Proactive behavior also moderated the association of Covid-19 perception and entrepreneurial intentions suggesting that having negative perceptions about Covid-19 and being highly proactive led to less entrepreneurial intentions.

These results can, in one side, respond to the theoretical gap related to the role of proactive behavior and coping abilities in the relation of Covid-19 and entrepreneurial intention. In other side, these findings can be used to support promotion of entrepreneurial mindset among university students because if we better understand factors influencing entrepreneurial intention during crisis, we can design appropriate educational programs to boost students' entrepreneurial intention. The future entrepreneurial education program should take into consideration the existence of two types of entrepreneurs: *opportunity entrepreneurs* who are viewed as entrepreneurs who start a business in order to pursue an opportunity in the market, whilst *necessity entrepreneurs* are pushed by unemployment situation. These two categories will adopt different behaviors to adapt to the crisis context, which has been proven by our research results. In order to implement a suitable entrepreneurial educational program for future entrepreneurs responding to all their needs and behaviors, we suggest to develop multiple pathways to learn the same content. Based on the recommendations to revolutionize business education of Krishnamurthy (2020), we firstly suggest that students can learn also from artificial intelligence. It provides a personalized learning experience by identifying their learning needs and preparing them to an in-person experience. Secondly, entrepreneurial education program must be designed in such a way that pursuit the current context and events. It would be better to emphasize the role of continuing learning based on contextual elements instead of enumerating subjects. Students need to be teach what they need and when they need it. More than that, multiple factors and actors have to design the entrepreneurial learning program: professors, mentors, experts, algorithmic systems, institutional actors, and students also may learn from each other through teamwork, para-scholar activities.

As the highest impact of artificial intelligence and the abundance of information, entrepreneurial education program should not forget to push students to identify the right problem and the right value added of their project. Krishnamurthy (2020) said: "[T]he future is not about the answers. It is about what problem we wish to solve, given what we know."

Entrepreneurial education program must enhance the intellectual and reflective process that precedes the business plan.

According to the moderation effect of proactive behavior and coping abilities, universities must be aware of the existence of two students 'profiles: opportunity entrepreneur and necessity entrepreneur. They do not react in the same way during a crisis and their entrepreneurial intention may be affected.

However, we acknowledge that this survey has several limitations: (1) size and heterogeneity of the sample, (2) focus on one context (Morocco) and (3) focus on one target (university students).

Therefore, our article provides some puzzles for further research: we recommend to explore more the role of proactive behavior and coping abilities and to use qualitative method and longitudinal survey in order to better understand how they impact the relationship discussed by the article. It would be better to extend this study and test our theoretical model in different geographical context over the world which can allow the generalization of our findings.

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Chapter Two

Longing to Break Free: Can a Basic Income Grant Boost Entrepreneurship among Young Men in the South African Countryside?

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Abstract
The Covid-19 pandemic has re-ignited a debate about the Basic Income Grant (BIG) in South Africa. The government recently announced its intention to introduce the grant at an unspecified date, claiming the BIG will help youth transition to work or entrepreneurship (Business Tech 2021). The forthcoming BIG will be modelled on the Social Relief of Distress Grant (SRDG), which was introduced in May 2020 as a measure to alleviate the suffering caused by the pandemic and subsequent lockdown.

This paper will reflect on the potential of a permanent BIG to facilitate for entrepreneurship among young males in a small rural town in the Eastern Cape, by providing an ethnographic account of their survival strategies, aspirations and notions of personhood. Although young men nurtured dreams of business creation, these aspirations were projected into an uncertain future, held to be feasible first after they had obtained stable wage labour. One explanation is found in emic ideas about personhood, which discouraged the men to negotiate assistance from their social networks because this was likely to create a prolonged dependence on female relatives. While the size of the SRDG was not large enough for the men to start a business without the support of their wider network, this article addresses why a more generous BIG is unlikely to change how young men evaluate the prospects for entrepreneurship.

Introduction

"I would never sit down and wait for this new grant… for that 350 [Rands]. That's pocket money." Stanley took another sip of his beer before he continued: "The youth here will just get lazier than they already are." It was an evening in late April, and we were watching an action movie and sharing a couple of beers at Stanley's place in Paterson, a small rural town at the outskirts of Gqeberha.[1] Local unemployment was rampant, but Stanley was among the lucky few who enjoyed stable employment. Our conversation had gradually shifted from John Travolta's exploits on the TV on to the president's recent speech. Some days earlier president Cyril Ramaphosa (2020) had announced the introduction of the Social Relief of Distress Grant (SRDG) in a bid to alleviate the hardship caused by the pandemic and the subsequent lockdown. Everyone who was unemployed and not a beneficiary of an existing social grant was eligible to apply and collect 350 Rands (22 €) on a monthly basis. I was taken aback by Stanley's comment; the amount might be small but surely it must be better than nothing, I asked. Stanley countered that it was not just about the amount, pinpointing how emasculating it was to receive money that was neither earned through labour nor conditioned on any other contribution. "I would be so embarrassed if people knew I applied," Stanley went on, "anyone can make 350, they just have to find a way." His reaction was harsh, but during the following weeks I learned that it was closer to the norm than the exception. The next day I ran into Leeroy and his friends (between 18 and mid-thirties). Because they were all unemployed or on short contracts, I had expected them to be more positive about the new grant. On the contrary, they also complained about the SRDG being "pocket money," telling me they had no intention of accepting this pitiful offer by the government. Instead they assured me how they easily could make 350 Rand or more in less than a month through their own effort. I was bewildered by their response, given the countless times I had listened to them grumbling about the everyday hassle of getting enough cash to buy a single cigarette. Yet, within the span of a couple of months all confessed to having reconsidered. I was curious to learn whether they saw the grant as a catalyst for entrepreneurship or not, because the men frequently shared their dreams of one day starting businesses. The response was unanimously negative; in fact, the men considered the questions about entrepreneurship rather peculiar.

1 Formerly known as Port Elizabeth.

Everyone claimed they intended to spend the grant on food, electricity bills or debt repayment.

Together with the distribution of food parcels (Ekeland 2021) the SRDG grant was intended as a temporary measure to alleviate the suffering caused by the global pandemic and subsequent lockdown. The SRDG has however been extended several times and is still being distributed at the time of writing (SASSA 2022). Its future is uncertain, but the government's wavering promises to introduce a Basic Income Grant might offer some clues. According to the minister of the Department of Women, Youth and Persons with Disabilities, Maite Nkoana-Mashabane, the proposed BIG will be modelled on the SRDG, and will "(...) support youth to transition into employment or entrepreneurship" (Business Tech 2021). The speech's emphasis on entrepreneurship is of particular interest because it has received less attention in the scholarly and public debates on basic income grants compared with impacts on health, nutrition and wage labour participation (Ferguson 2010; Marais 2020; Seekings 2020). Because a prospective BIG is likely to build on the experiences with the SRDG (see Zulu 2021), understanding the spending patterns of SRDG beneficiaries can yield predictions about a BIG's potential to spark entrepreneurship.

This paper will demonstrate how emic ideas about personhood and social networks are crucial for understanding why access to the SRDG did not generate any motivation for pursuing survival entrepreneurship by young men in Paterson, and why a BIG, even if the grant amount is set significantly higher than the SRDG, is not likely to change this. Relative financial independence was an important component in local notions of male personhoods, both in relation to female family members, romantic interests and to other men. For example, a man was expected to provide financially for his wife or girlfriend, as well as his children. Moreover, by publicly demonstrating his ability to survive without having to enter into a relationship of dependence, he underscored his autonomy, and could thus be socially recognised as the equal of other men, regardless of differences in wealth. Without a stable income, young men struggled to realise these ideals, often finding themselves reliant on negotiating assistance from unstable social networks. A prolonged inability to reciprocate tended to generate ascriptions of dependence in these relationships, dumping on young men the additional burden of having to cope with insinuations of incompetence or laziness. Together this contributed to installing a reluctance to pursue survival entrepreneurship because this heightened the risk of

relationships degenerating from one of interdependence to one of dependence. By illuminating these processes, the article will contribute to the anthropological literature dealing with the intersections of entrepreneurship, personhood and distributive networks (Beuving 2004; Beresford 2020a, 2020b; Stewart 2003) as well as the contemporary debate on BIG in South Africa and beyond (Ferguson 2015; Marais 2020; Standing 2017). One aim of this article is to provide a critical analysis that will be accessible to both policy makers and other stakeholders.

The paper will first revisit the BIG debate in South Africa, before providing a brief outline of survival entrepreneurship. It will then give a thick description of the lives of a sample of young men in Paterson, discussing their survival strategies, and how their relations to notions of personhood. The following sections will provide a linear account of the men's experience with lockdown, the SRDG grant and the emergence of the town's Covid-19 entrepreneurs. Finally, I will discuss why access to social grants is unlikely to boost male entrepreneurship in Paterson or comparable areas.

Methodology

The data for this article was collected through ethnographic fieldwork conducted in Paterson in the Eastern Cape between September 2019 and October 2020. The overarching goal of the research was to gain a better understanding of survival and distribution strategies in the rural region between Gqeberha and Cradock. Paterson was selected due to its size, convenient location, and because I established cordial contacts with local community leaders early on. I moved to Paterson in December 2019, before relocating to one of its two townships in May 2020. Although Paterson has two townships, where the majority of residents respectively identify as AmaXhosa and Coloured, the data for this article was exclusive collected in the latter township. This decision was taken based on my close relationship with youth from this location. Names and personal details have been changed as promised when requesting oral consent.

My data was collected through participant observation, supported by in-depth conversations and semi-structured interviews. A typical day involved spending time with different residents, talking and observing the flow of life, so called "deep hanging out." I went early to town and headed home late in the evening. Scratch notes were taken either in my notebook or on my phone, before writing up more detailed accounts in the evenings. During fieldwork I relied on a set of generic themes when coding my data,

while also following an inductive approach when going over my fieldnotes to allow for serendipity. Being attentive to the value of unexpected discoveries is one of the strengths of ethnographic research (Pieke 2000: 145-146; Rivoal and Salazar 2013). My coding became more systematic when I returned from the field. This process was shaped by an engagement with secondary literature, comparative ethnographies and discussions with colleagues (Madden 2010: 145-148).

I did of course stand out as a White man in predominantly Coloured and Black communities. In getting access it helped that I was European, for I was repeatedly told of how my behaviour and speech made me a comical figure, that did not fit easily into any existing social category. Nevertheless, people kept me at arm's length during the first months and expressed reluctance to take part in the research. It was the young men featured in this article who were among the first to welcome me into their lives. They put down an immense effort to convince the wider community members to partake in my research, and with their help my base of research participants grew. Although I generally had relatively few issues with recruiting female research participants around my own age and older, I did not gain access to the lives of young women, hence their absence from this paper.

The direction and themes of my research were to a large extent shaped by the Covid-19 pandemic. South Africa's national lockdown forced my research participants and me to be more creative when it came to conducting fieldwork, especially because the curfew only allowed for movement deemed essential (visits to grocery stores, pharmacies and hospitals) between 10.00-18.00 h. every day. A key strategy was to schedule meetings with research participants by the stores in town during this time slot, supplemented by contact over WhatsApp or landlines, and ferrying people with my car to supermarkets in nearby towns. I was fortunately able to join the town's Covid-19 committee, and I accompanied the members on excursions into the townships to inform residents about the official health advices and clarify the lockdown regulations. When the police gradually eased their patrolling by May 2020, people increasingly began disregarding the curfew, both out of necessity and due to concerns about the wellbeing of family and friends. After friends had violated the curfew to visit me on several occasions, I decided to resume visits to the townships, so that my friends would not be the only ones at risk of being fined by the police. We adhered to the advices given by the health authorities regarding social distance, hand washing and use of facemasks.

The BIG Debate

The BIG debate in South Africa gained traction during the first decade of democracy when trade unions banded together with other civil society groups in calling for the government to introduce the grant (Standing and Samson 2003). The "coalition/alliance" scored a small victory in 2003 when the Taylor Committee, a government-appointed committee tasked with revising the country's social welfare system, included a modest proposal for a BIG in their final report. However, the proposal was dismissed by the government, mainly due to opposition from the Treasury department headed by Trevor Manuel, who claimed it would deplete the state coffers (Marais 2020: 366). In the following decades civil society groups, notably Black Sash (Black Sash 2020), continued to champion the grant but despite their effort, the BIG campaign remained the domain of activists and academics, never capturing the imagination of neither the elites nor the broader sections of the population (Seekings 2020: 263). This changed suddenly in 2021 following the first official announcement of the government's interest in introducing a BIG. Since then there have been contradictory statements from official sources, but there is no clear prospect of implementation at the time of writing (autumn 2022), at least not any time soon (Mahafu 2022). This notwithstanding, public interest in a prospective BIG does not seem to have dampened. Initial reactions were marked by cautious approval, with one division in the public debate running between those preferring a *conditional* or an *unconditional* BIG (the latter called UBIG). Business Unity, citing concerns that an UBIG will deplete the state's coffers, urged the government to introduce a limited grant for the unemployed, which they suggested could be framed as a BIG (Coovadia 2021). From the opposite corner, almost one hundred organisations, including the Congress of South African Trade Unions (COSATU), Black Sash and the South African Federation of Trade Unions (SAFTU) submitted a petition to the government in favour of an UBIG.

Entrepreneurship, BIG and SRDG

During her presentation of the Social Development Department's budget vote for 2021/2022 minister Lindiwe Zulu talked about Sonto Sithole from Dawn Park in Gauteng, who had used her SRDG to finance the start-up of a bakery (Zulu 2021). That this example was given just before the minister moved on to outline the vision for the forthcoming BIG was likely not coincidental. Other politicians soon followed her in framing a

BIG as positive for entrepreneurs. Blade Nzimande, General Secretary of the South African Communist Party, substantiated his party's endorsement of the BIG by emphasising their conviction of the grant's potential to improve conditions for people working in the informal sector as well as for SMMEs (Small, Medium and Micro Enterprises) (SABC News 2021). The popular debate has also witnessed a surge of opinion pieces stressing the anticipated positive effect of the grant on business creation (Cook 2021; Sinesipho 2021). This is another interesting turn of events, because explicit reflections on entrepreneurship were until recently largely absent from the BIG debate (Seekings 2020).[2] Although some members of the Taylor Committee expressed optimism about the grant's potential for boosting entrepreneurship, the final report concentrated on how BIG could assist the unemployed transit into the formal workforce (Barchiesi 2007). Moreover, it is worth noting how entrepreneurship was absent from the most recent BIG booklet published by Black Sash (Senona 2020), one of the organisations which has been most vocal in favour of the grant. However, a survey among potential BIG beneficiaries by the market research agency KLA found that 42% were interested in using the money to start a business (Herridge 2021). The survey was designed based on a scenario where the grant was set at 1,268 Rand, the amount required to improve the intended beneficiaries' standard of living according to a Green Paper prepared by the Department of Social Development (2021). One dimension that so far has received scant attention is the heterogeneity of the potential recipients. Few commentators have reflected on how spending patterns will be influenced by factors such as gender, location and values.

Entrepreneurship in South Africa

In the wake of the havoc caused by the global pandemic some scholars have pointed to entrepreneurship as a path out of the wreckage (Ratten 2020; Liñán and Jaén 2020). Such a discourse is nothing new in South Africa, where the ANC governments for decades have held forth entrepreneurship as a key pillar for economic transformation and empowerment. This discourse, along with government policies for assisting business creation, has however mainly concentrated on formal business creation (Beresford 2020a: 112-114). Although subsequent governments increasingly have

2 This is not exceptional for South Africa, as relatively little of the BIG literature has dealt explicitly with entrepreneurship (Standing 2017: 52).

begun supporting informal businesses, results have so far been meagre (Du Toit *et al*. 2020: 3). With the informal sector in South Africa being considered small in comparison with other countries on the continent (Manyaka 2015; Neves and Du Toit 2013), the promise from government officials that the BIG will boost entrepreneurship might herald a strengthened interest in survival entrepreneurship. Survival entrepreneurship tends to refer to businesses where the goal is household survival rather than growing the business, as pointed out by Prominent Choto, Robertson K. Tengeh and Chux Gervase Iwu in their synopsis of definitions of the term (2014: 94-95). Examples range from street hawkers and hair saloons to back-yard mechanics (*ibid.)*, and aforementioned Sithole's bakery. These entrepreneurs usually rely on a wide range of different credit schemes for starting-up and maintaining businesses, including negotiating assistance from relatives or friends through interdependent relationships (Neves and Du Toit 2012). Dependence on relatives is not limited to survival entrepreneurs. In a recent comparative study of entrepreneurial hubs in Cape Town, Melissa Beresford (2020b) documented how the ability to tap into distributive networks was equally important for both Black entrepreneurs from the township and more affluent White entrepreneurs from the city. Whereas the latter benefited from loans from parents who did not expecting a quick, if any, return, the assistance Black entrepreneurs received from kin and wider community members were tied up with notions of reciprocity and obligations, leaving them with less surplus. Beresford's article is a critical reminder of how prospects for entrepreneurship in South Africa are shaped by factors such as location and access to distributive networks.

Situating Paterson

Paterson is one of those small rural towns found along the highway between Gqeberha and Cradock. The majority of the town's residents stays in one of the two townships. Over the course of the last decades the population has been forced to cope with poor service delivery and a consistently high level of unemployment. The crumbled railway station by the edge of town stands as a symbol of the general negligence shown by government and big business for the community. People often spoke of how most households survived on the social grants their members received; a truth that requires some qualification, as the loans people took out from each other and from *skoppers* (loansharks) were of near equal significance. For young men like Leeroy, their best chances lie in getting temporarily employed by one of

the town's SMMEs, whenever one secured a government tender. Contracts were few however and only a handful of workers were needed each time, so it did little to alleviate overall unemployment. Although SMMEs had collectively agreed to hire people from the community's unemployment list, there were frequent complaints about the businessmen ignoring it in favour of hiring friends or family. Leeroy took a pragmatic approach to this, telling me how favouritism did not upset him as he saw his best chances of getting a job in having an employed family member or friend putting in a good word for him at their respective workplaces. In the meantime, Leeroy and his friends were usually found by a run-down house, conveniently located next to a small shop. The old concrete house had become an infamous hangout spot for local youth; young unemployed men in their early twenties congregated across the small yard, often joined by female high school students who were skipping class. A heavy tree offered shade from the burning rays of the sun, while the interior of the house provided seclusion whenever they shared a bottle of beer or someone lit up a joint of *daggah* (marihuana). Greetings, information and good-humoured insults were exchanged with people passing by, before they at some point during the day pooled together whatever cash they had to buy single cigarettes or a bottle of soda. Few of them headed their own households. Leeroy stayed with his grandmother and several cousins. He never complained about his living arrangements, not even when he was confined to the house during lockdown, so he got along better with his housemates than some of his peers. Several of them were living as nomads, frequently changing residence after simmering tensions with their housemates boiled over. Among the many reasons for these conflicts, the failure to contribute financially to the household's upkeep tended to be a fairly common one.

Personhood and Survival Strategies

When older residents offered their views on male youthhood in Paterson, the young unemployed men were frequently portrayed either as victims of a broken education system, cast into an unforgiving job-market, or as agents of their down demise, escaping into drugs and alcohol instead of taking steps to find work. For their part, Leeroy and his friends appeared to adopt a "devil may care" outlook on life in public, caring little for the pity and contempt shown to them by other residents. A different picture emerged when speaking to them in confidence, where they confessed to feeling embarrassed about the state of their lives. Some of them were or

had struggled with substance abuse. What had begun as recreational experimentation with alcohol, *daggah* and *tik* (methamphetamine) at an early age, had become a means for coping with personal calamities; the loss of a parent or the inability to pay child support. Feeding into this was the men's failure to live up to local ideas about personhood. In their relationship to girlfriends or wives, men were expected to be the main financial provider. They could expect to be recognised by other men as their social equals as long as they were known to be autonomous; meaning the ability to make a living without having to rely on negotiating or pressing claims on the wealth of others. Wage labour offered the most reliable path to achieve this, but men who found ways to make money through their own skills, creativity and hard work were awarded a similar recognition. To paraphrase Stanley from the introduction, "you just need to find a way." Money was hence intimately tied to possibilities of archiving socially recognised manhood. Learning about how a man should avoid entering into relationships of dependence with other residents are a crucial part of the coming of age for boys in Paterson. Fiona Ross, who followed a marginalised community with mainly Coloured residents in Cape Town for more than a decade, has documented how children learn to navigate heterogenous networks from an early age (Ross 2014: 101). A child might be fed at one household, sleep by another, and get school fees covered by yet a third. This scenario resembles the one in Paterson. The transition to manhood thus involves learning to discover creative ways of obtaining money or food outside of interdependent relationships. Sadly, young men frequently failed to live up to the expectations of their female partners. Instead it was not uncommon for men to rely on the women in their life; mothers, grandmothers, sisters or girlfriends, and in times of dire need, ex-girlfriends. Being publicly known to depend on female relatives long into adulthood, denied men recognition as autonomous individuals, thereby hampering their transition into proper manhood. This crisis of masculinity was thus tied up with an anxiety over dependence. Smirks and gossip frequently framed young men in such relationships as agents of their own demise, labelling them as incompetent or lazy. For Leeroy and his friends, not a day went past when they were not reminded of their failure to live up to this ideal. Yet they had not given up and were determined to one day break free from their current life as dependents.

Resisting Dependence

"Boredom," this was the word Leeroy felt most accurately summed up his life. Boredom did however not imply passivity. For the youth, everyday life was shaped as much by urgency as stagnation. This urgency was so ingrained that it did little to challenge the general sense of boredom. Every day, youth invested energy into contemplating and pursuing strategies for getting money. These usually involved offering to do piecejobs or negotiating assistance from more financially resourceful residents. Sticking to the same hang-out spot had a strategic edge to it too. Residents who needed urgent assistance, such as unloading a *bakkie* (van) or transporting bricks between properties, knew where to find helping hands. According to Leeroy everything was better than having to once again ask a female relative for assistance.

One strategy for resisting being labelled as dependent on someone was by framing a request for assistance as a loan. It was not unusual for borrowers to insist on formalising such exchanges, by suggesting dates for repayment. Ross (2014: 105) has argued that the act of borrowing assumes potential equality between the involved parties, so the inequality in these relationships only becomes problematic once the debtor defaults. This appears to hold for Paterson as well, where indebtedness overlapped with ascriptions of dependence. A desire to limit financial transactions in intimate relationships was thus among the reasons why a substantial number of residents took loans from *skoppers*. These informal micro-lenders were generally held to be discreet, and both loans and possible indebtedness in these relationships were thus easier to conceal. Yet, as Leeroy pointed out, these options were difficult to access for him and his peers. *Skoppers* demanded the grant card, ID book or both as collateral, and rarely accepted unemployed clients who lacked any assets to serve as collateral.

Instead they come up with other, creative strategies for resisting the inequality in social relationships. Leeroy's relationship with his aunt can exemplify this. He visited her regularly to ask for food or money, albeit without making these requests outright. Instead he took initiative to help out with small tasks, like cleaning the yard. What these practises had in common was that his aunt never would have paid someone to do these chores if Leeroy had not visited. The money or food he received from his aunt could thus be re-imagined as a form of payment. As Leeroy explained, doing piecejobs was sometimes symbolic, akin to a type of strategy for transforming a hierarchical relationship into one of equality. It was a way

to resist being stereotyped as financially or socially indebted. The other party was well aware of this, and if they were inclined to give money, either unconditionally or as a loan, they would generally discuss what piecejob they would be interested in having executed. Few desired to humiliate an individual asking for assistance by refusing them the chance to transform the relationship into a more equal form.

Informal Artisans

Around the time I moved into the township, Leeroy reminded me to reach out in case there were problems with the circuits in my new house. Soon after I ran into Jacob who told me to get in touch if I had issues with the pipes. Several others dropped similar hints about the skilled artisan jobs they were qualified to do. None had certificates attesting to their skills, instead most had entered into an apprenticeship from a young age with an older resident who worked informally as an electrician, plumber or bricklayer.[3] These apprenticeships had no definite start or end-date, and it was not uncommon for men to continue to assist their "teacher" long into their thirties. It was both a source of pride and a cause of despair that the community was home to so many men skilled in different trades, for the abundance of men with similar qualifications drove prices down. While reputation played a big part, this mainly benefitted older men with years of experience behind them. Still, only a handful of residents managed to survive on these jobs alone, and few referred to it as their "business."

While these informal artisan jobs might resemble a type of "infant" survival entrepreneurship, it was not necessarily seen that way locally. When I asked Leeroy and Jacob to introduce me to the informal businesses in the township during the early days of my fieldwork, they brought me to visit exclusively middle-aged women selling home-made treats like *bompies* (popsicles) or popcorn. While their sales barely yielded a profit, these ladies nonetheless spoke passionately of their dreams to grow their businesses but added how unattainable this was given the scant profit margin. Like these women, young men also expressed a desire to invest in their skills if they obtained sufficient funds; with the money they imagined purchasing papers attesting to their qualifications. Their goal was however not to move on to register a company. On the contrary, Leeroy and his friends explained how papers made it easier to enter the formal job market. Intriguingly, just

3 These jobs were usually also included when people spoke of "piecejobs."

as papers were perceived as a stepping-stone to get a job, a job was a crucial step towards one day starting a business. To grasp the conflation between wage labour and business aspirations, it is necessary to take into account ideas about personhood and the nature of social networks.

Dreams of Labour, Dreams of Business

Almost without exception all young men dreamed of starting their own business. Leeroy for his part could speak passionately about possible business ideas, but ask him when he envisioned to realise them, and his reply would typically be something like "One day," followed by a sad chuckle. His immediate goal was landing a stable job. With a stable job the days when people branded him as lazy or a leech on others' wealth could be confined to the past. Instead people would approach him for assistance, symbolizing a move from debtor to creditor. Yet there was more than meets the eye. They wanted me to know how the humiliation and embarrassment they experienced on a daily basis had not turned them into bitter cynics, quite the contrary; when they become creditors, their conduct would be fair and empathic. Their assertion of how their employment would indirectly benefit the wider community, was reflected how they framed their motivation for starting a business as being partly about community upliftment. In the men's imagination, the entrepreneur was an agent of positive change.

Young men often spoke of their desire to do their part in crafting a stronger and warmer community. Public displays of empathy and concern for others was then also recognised as masculine traits.[4] The desire to be role models for children provides an example. I frequently listened to young men using their own biographies to teach life lessons about how one could always find a path under precarious conditions, while reminding their audience how humiliation and pain were constant companions of the unemployed. To take another example, Leeroy's older unemployed cousin Jack regularly coached the young neighbourhood boys in rugby. I often watched them play; a dusty street serving as field and plastic bags moulded into the shape of a rugby ball. Jack was convinced that as long as they kept trying, one or two players could eventually make it to the professional league. His personal dream was to one day sponsor and organise regional youth rugby tournaments. Jack imagined that the day he headed

4 This was likely shaped by the strong presence of active Pentecostal churches in the community.

his own company was when he could move forward with this aspiration. Such associations between business creation and becoming a community benefactor is not unique to Paterson. Beresford (2020a) recorded similar sentiments among young Black South African township entrepreneurs in Khayelitsha and suggested the term *legacy building* to capture their business imaginations. It entails "(1) the desire to build wealth that supports kin and community, (2) the desire to mobilize businesses for social transformation, and (3) the desire to centre a Black presence in South Africa's economy" (Beresford 2020a: 71-72). There are stark differences between Beresford's research participants and young men in Paterson in regard to the socio-economic profile of the location; the Khayelitsha entrepreneurs had for example generally attended institutions of higher learning and some had experience with stable wage labour. Nevertheless, both share the experience of residing in areas with high unemployment and where the larger businesses were owned by White businesspeople. In both places this motivated budding entrepreneurs to imagine their businesses as beneficial for the wider community. This goes a long way in explaining the notable lack of interest in setting up micro-businesses akin to survival entrepreneurship in Paterson, as this would yield a pitiful, if any, surplus to realise dreams of community upliftment. However, the entrepreneurs from Khayelitsha and the young men from Paterson differ in regard to access to distributive networks. Harnessing assistance from family and friends did not spark the same anxiety about dependence in relationships in Khayelitsha as it did in Paterson, nor was the assistance as formalised. Starting a micro-business in Paterson was not possible without accumulating substantial debt with close friends and family, and aspiring businessmen hence risked indebtedness and fractured relationships. The heads of the local SMMEs I asked to weigh in on youth entrepreneurship also cited the risk of indebtedness as a major barrier for business creation. They claimed this was an inevitable consequence of youth's lack of experience, telling me they rather encourage them to concentrate on job-hunting. And young men heeded their advice. For the time being they stuck to juggling piecejobs with job-hunting. Yet, the imagined linkage between wage labour and entrepreneurship had taken form during a period when it was difficult for the youth to access money outside of social networks. By the winter of 2020 this was about to change.

Lockdown

"It's going to be really boring. Nothing to do but stay inside waiting," was Leeroy's response to the announcement of the lockdown. Initially few of the men believed a strict curfew would actually be enforced and tested the waters by visiting each other in the evening. The police anticipated this, and after chasing them back to their respective houses several nights in a row, most either came to terms with the curfew or learned to move stealthier. After a couple of months, the policing of the curfew was gradually relaxed, and by June patrols had all but stopped. Youth once more congregated by the old house, and life in the township resumed an uneasy sense of normalcy. While people attempted to comply with the health and safety recommendations, it was as Leeroy bitterly remarked, ironic how officials bashed the population for not adhering to the recommended measures when hand sanitizers were both expensive and in short supply, and access to running water was limited to a few hours a day.

A consequence of the lockdown was the bloating of existing inequalities. Paterson was fortunate in evading the shock of a substantial job loss, because the factories close to town were granted permission to keep production going and the nearby game farms retained much of their permanent staff. Yet, this could not stop a collective anxiety over the possibility of a sudden mass retrenchment from gripping the community.

The Covid-19 Entrepreneurs

Not long after the curfew restrictions were officially eased in mid-June, I noticed a surge in the number of advertisements for everything from freshly cooked meals and bundles of frozen chicken, to cleaning products and brand-name garments circulating on WhatsApp. Street hawkers and food stalls had been conspicuously absent prior to the lockdown,[5] and there had only been a limited circuit of informal re-sale. Because the hiking fee to Gqeberha had shot up, an increasing number of residents were asking themselves whether it was cheaper to purchase basic goods locally instead of resuming monthly shopping trips to the city. These "Covid-19 entrepreneurs" were all labourers who had kept their jobs during lockdown. Peter, in his thirties and employed by a game farm, was among the first to start advertising his products; freshly cooked meat dishes and garments. He

5 A notable exception was once a month around grant payment when a handful of older women sold woven and second-hand clothes.

explained to me how he had long nurtured a dream of starting a business, but that he had not imagined it to be feasible until sometime in the future. The experience of being confined to his home with the threat of retrenchment hanging over his head pushed Peter to move ahead. He made a point of highlighting how his business was his way of helping the community, by saving residents the taxi fare to the city. Peter's narrative echoed in the words of the other Covid-19 entrepreneurs. Those I spoke with all claimed the lockdown was the catalysator that convinced them to realise their business dreams. Moreover, all insisted on how starting a business during Corona times was their way of assisting the community during these difficult times. Their goal was not to transition from wage labour employment to exclusive reliance on their business but rather to use their wages to maintain and grow the business as a side hustle. If they were to lose their jobs, they held no illusions about surviving solely on their business.

Spending the SRDG

As mentioned in the introduction, youth's initial reaction to the SRDG was lukewarm. This can also be partly attributed to a scepticism about whether the money in fact was going to be paid out. After having waited in vain for the official food relief a couple months earlier (Ekeland 2021), the faith in service delivery had hit an all-time low. More importantly, the prospect of passively receiving money did not sit well with the young men. This harks back to how relationships of dependence were perceived as emasculating. The rationale behind the fact that most in the end decided to apply was multifarious. Starting from their own explanation, one recurring theme was the confusing application process, which several described as being akin to an enigma[6]. Intriguingly this appeared to have an appeal in the eyes of some of the youngsters, because successfully filing an application demonstrated admirable traits, such as navigating a complex, unknown terrain. What likely played a more paramount role was peer solidarity; their status as equals vis-à-vis their peers was not diminished if they applied when everyone else did so as well. Many also felt pressured by female family members, especially mothers and aunties. I vividly recall talking with one man who loudly asserted how he had no need for the grant when he could

6 People accessed information about the grant primarily through conventional and social media, but there was an abundance of misinformation circulating on the latter, including inaccurate and false step-to-step application guides.

make much more doing piecework, only to be rebutted by his mother who suddenly emerged from the house behind us. She made it clear that her son was going to apply as soon as he figured out the application process. While senior men with employment or other stable income were prone to consider young men's novel relationship to the state as emasculating, this was not shared by the women in the young men's lives, testifying to the different personhoods between which these young men moved. Women's more pragmatic approach appeared to reflect the long and continuing resistance against ascriptions of welfare dependence, levelled in particular against female beneficiaries of the childcare grant (Bähre 2007; Granlund and Hochfeld 2018). Furthermore, Ross (2015: 105) has pinpointed how dependency on the government does not give rise to the same humiliation as dependence on someone from the community. In Paterson entering into a relationship of dependence with the state could possibly serve as strategy for disentanglement from other, more socially and emotionally distressing local relationships of dependence. Early recipients unanimously spent the grant on groceries, electricity bills or debt instalments, thereby reducing the need to rely on interdependent network of friends and family.

Entrepreneurship and Social Grants

On the surface prospects of entrepreneurship in Paterson appeared promising. Almost all young men nurtured dreams of business creation, and this pool of young men were not idle but had acquired impressive skills and experiences in different crafts. Nevertheless, youth never considered survival entrepreneurship a viable alternative. As has been detailed above, aspirations toward business creation were pushed into the (distant) future, lying dormant until the budding entrepreneur had a stable job to rely on. One of the reasons was the fear of relational dependence, because starting a business necessitated taking larger loans from other residents. Access to the SRDG did not change this outlook, since everyone complained about how small the grant was, telling me any prospect of saving was unrealistic. A stable job facilitated a broader range of channels to obtain credit, mainly through taking micro-loans from institutionalised micro-lenders, thus keeping debt outside of their intimate relations and thereby countering the risk of dependence. This reluctance to rely on social networks for starting and maintaining businesses offers a different perspective on what initially appeared to be favourable conditions. As the anthropological scholarship on entrepreneurship has documented, micro-ventures tend to rely heavily

on accessing support and resources from interdependent networks to sustain operations and handle shocks (Gudeman 1978; Lundy, Patterson and O'Neill 2017; Stewart 2003).

Beresford's aforementioned research documented how distributive networks remain important, even when other policies and bursaries are accessible (Beresford 2020b: 124). Such a perspective on access to distributive networks further reveals how assessing the potential for entrepreneurship is not evenly distributed in the population but shaped by factors such as location and access to wider networks of support. This appears to be neglected in the wider discussion about the impact of a BIG. For example, in the national discourse on BIG, the intended recipients tend to be framed as a homogenous group, as the "poor" or "youth," thereby obfuscating how spending is shaped by the intersection of factors such as kinship, class, location and notions of personhood. A similar argument has been voiced by Sabine Klocke-Daffa (2017: 21-22) who has argued that studies of BIG should engage more closely with emic ideas about spending, distribution and personhood. Her argument is informed by fieldwork carried out among people in the destitute village of Otjivero in Namibia, who in 2014 received an unconditional grant as part of a national experiment to discover the potential of a national BIG to alleviate social needs and boost entrepreneurship. When the project was evaluated after two years the effect on nutrition was positive, but to the dismay of national politicians there was little evidence of the grant being used for entrepreneurial purposes (Klocke-Daffa 2017: 8, 16). Instead villagers in Otjivero used the grant to give and share cash, food and commodities (Klocke-Daffa 2017: 16). Sharing was a powerful value in Otjivero, but prior to the BIG experiment those who were unable to reciprocate were inclined to reduce their involvement in the local moral economy, rather than face the humiliation of never being able to participate on equal terms (Klocke-Daffa 2017: 11-13). One unintended consequence of the sudden access to the grant was how it allowed destitute recipients to become socially reintegrated in the local sharing economy (*ibid.*). This is reminiscent of how access to the SRDG allowed men to contribute food and cash to the household's upkeep, while at the same time reducing the need to negotiate assistance from their social network, thereby easing previously tense relations. Despite glaring differences between the two places, residents in both locations invested the grant in social relationships rather than in business creation. For villagers in Otjivero and residents in Paterson a prolonged unidirectional flow of

assistance caused both personal humiliation and social tension. Addressing this thus took precedence over alternative ways of spending the money. Under such circumstances, entrepreneurship does not emerge as the most attractive option. What this comparison illuminates is the importance of taking local particularities and differences seriously. James Ferguson (2015: 98) has warned us about the danger of focusing too much on what the poor should be doing, rather than what they actually do and dream of becoming. Ethnographic approaches are particularly well suited for this, because of the emphasis on in-depth, holistic studies of everyday life. According to Ferguson (2010: 177) a BIG aligns neatly with a neoliberal ideology, because it is imagined that the grant can liberate people from relationships of dependence, understood as informal distributive networks. When people do not have to devote a big chunk of their wealth to help relatives and friends, they can rather invest in informal business creation, or so it is imagined (*ibid.*). While a BIG will likely assist men in disentangling themselves from relationships of dependence, they are not set on becoming "De Soto-an" (entrepreneurial) heroes. Understanding entrepreneurship in Paterson requires knowledge about notions of masculinity, the fear of socio-financial dependence in intimate relationships and the recognition of labour experience. The take-away from this is that opportunities for survival entrepreneurship are shaped as much by emic notions of personhood and values of exchange as by access to markets and the possession of an entrepreneurial mindset. As outlined above the men did indeed demonstrate an entrepreneurial mindset through the survival strategies they rely on.

Implications and Concluding Remarks

Almost two years after the introduction of the SRDG, the amount still stands at R350, albeit the category of beneficiaries is now broadened to include those who receive the childcare grant. Sadly, a substantial number in Paterson still struggle to access the grant. They have told me how their applications are declined, but without being able to discover on what grounds. Among those men who have received the grant, their spending patterns remain as outlined above. If the size of the BIG matches the SRDG, this pattern will likely persist. A fair question is whether a rise of the BIG grant size to 1,268 Rand, the highest amount suggested by the Green Paper (Department of Social Development 2021), accompanied by access to public loans for budding entrepreneurs, will alter how the youth view the prospects of entrepreneurship. Alluring as this might sound,

there seems little reason for optimism. Young men are not accustomed to imagining themselves as potential businessmen. Neither is the community prepared to see them as such. A venture run by an inexperienced young man will struggle to be taken seriously. Instead it is more likely that a more generous BIG will help speed up a transition to wage labour, by allowing the men more surplus money to spend on relevant courses, and more importantly, funds to cover transport to Gqeberha for job-hunting. Presently, my research participants complained that the SRDG was hardly enough to cover both food and electricity, so setting aside some cash for job-hunting related activities proved unrealistic. If the government is serious about lifting young people out of poverty, a BIG needs to be significantly more generous than the SRDG. If the grant facilitates a faster transition into employment, it might still have a positive effect on entrepreneurship in the long run, given the correlation between formal employment and business creation. Also, it could falsify popular apprehensions about a BIG's negative impact on wage labour participation. Policies seeking to facilitate male youth entrepreneurship in places like Paterson are bound to fail, as they run counter to the youth's own ideas of entrepreneurship. Although this paper has stressed how local notions of personhood, intertwined with existing distributive networks, impede youth entrepreneurship in Paterson, and likely in places that share this town's characteristics as well, prospects might be more promising in other parts of the country. I will end this paper by highlighting one positive effect of the SRDG which has not yet received as much attention as warranted. That is the effect on young men's mental wellbeing. Because the grant can take some inequality out of social relationships, it is fair to assume that it helps men gain more confidence, and dampen negative emotions arising from prolonged experience of being in relationships of dependence. A grant is far from a quick fix to issues of mental health, but it is a welcome step in the right direction.

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Chapter Three

Adaptive Resilience among Agri-Businesswomen amidst the Covid-19 Pandemic in Kenya

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Abstract
The pandemic of Covid-19 was confirmed to have reached Kenya on 13 March 2020. Even though Covid-19 appears to have been relatively less deadly in Kenya compared to most Western countries, preventative measures taken by the Kenyan government and international governments have still severely affected Kenya's entrepreneurs. Organizations such as UN Women have reported that women are disproportionately affected by Covid-19 through the increased time spent on unpaid care tasks, as well as harmful gender norms being amplified. Based on online qualitative research over a 16-month period, this article describes how Covid-19 and the related government measures has affected the businesses of agri-businesswomen in Kenya. While many negative effects on the women's businesses were reported (e.g. increased transportation costs, export sales plummeting, temporary closure of business, decreased farmer productivity), Covid-19 is also seen as an opportunity since it has increased the demand for healthier foods and the use of digital methods, prompting several of the entrepreneurs to change their business models (e.g. moving from international to domestic markets, moving into digital sales, digital farmer management). This article demonstrates the adaptive resilience by women entrepreneurs amidst a global crisis and it analyzes different strategies taken that have resulted in different outcomes for business survival and growth.

Introduction

On 11 March 2020, the World Health Organization officially announced the new coronavirus SARS-CoV-2 (Covid-19) to be a pandemic (WHO 2020). The Covid-19 pandemic triggered a global crisis by placing an unprecedented burden on many health systems worldwide, while the control measures taken by governments all over the world heavily affected national and international economies by bringing much economic activity to an abrupt halt (Kuckertz *et al.* 2020). The first Covid-19 cases in East and Southern Africa were identified later than in other parts of the world. Governments in the sub-region responded differently, whereby some countries such as Mozambique imposed a national lockdown, while others such as Tanzania did not (Liebrand *et al.* 2021). First studies (e.g. Bartik *et al.* 2020; Dai *et al.* 2021; Kalemli-Ozcan *et al.* 2020; Liu *et al.* 2020) have shown how quarantines, closures of non-essential businesses, and curfews have negatively affected small and medium-sized enterprises (SMEs), which form the backbone of economic activities in most countries in the sub-region (UN Women 2021). Like other crises, Covid-19 has uncovered the need for entrepreneurs to be resilient and find alternative solutions to mitigate damages, recover, and rebuild society (Alexander 2019; Pheng *et al.* 2006).

While a body of research on entrepreneurship and crisis management already exists (e.g. Cowling *et al.* 2012; Parker *et al.* 2012; Portuguez Castro and Zermeño 2020; Smallbone *et al.* 2012; Williams and Vorley 2015), most studies have focused on entrepreneurship in Western countries. By contrast, limited research has been conducted in African, Asian, and Latin American contexts, especially on how women entrepreneurs respond to crises (with the exception of e.g. Abdul Rani *et al.* 2019). Focusing on women entrepreneurs is especially relevant as Covid-19 is considered a gendered crisis due to disproportionately affecting women, although the differences in impact within this heterogenous group are rarely stipulated. The UN Women report "Impact of Covid-19 on gender equality and women's empowerment in East and Southern Africa" states "the evidence suggests that the already existing inequalities between women and men and between the different socio-economic groups have been exacerbated by the pandemic" (UN Women 2021: xi). Responding to these two main shortcomings in the literature, this article uncovers how women entrepreneurs in an African context – in this article, specifically Kenya – have responded to Covid-19 by adopting several strategies. Accordingly, it contributes to the broader resilience in entrepreneurship literature and uses Covid-19 as a recent example

of a crisis. This article proceeds by framing the research in the existing literature on resilience and entrepreneurship within the African context. Second, the methodology used to conduct this research is explained. Third, the research results are outlined by providing a timeline of the measures taken by the Kenyan government, how this affected the women's businesses at multiple levels and how this has prompted them to adopt short- and long-term adaptive resilient strategies. Finally, this article concludes with its main contributions to literature and how different adaptive resilient strategies have resulted in different outcomes for business survival and growth.

Literature Review: Entrepreneurship, Resilience and Crisis Management in Africa

Entrepreneurship in essence is characterized by generating new ideas that create value for companies and society (Fisher *et al.* 2020; Shane and Venkataraman 2000). However, crisis situations can place pressure on this process or suddenly provide new opportunities, whereby entrepreneurs are required to act more dynamically and innovatively (Ratten 2020). A crisis in relation to entrepreneurship studies is defined as an unpredictable event that requires a response from organizations (Doern *et al.* 2018). The body of research on entrepreneurship and crisis management has substantially increased over the past decade (e.g. Cowling *et al.* 2012; Doern 2014; Parker *et al.* 2012; Smallbone *et al.* 2012; Williams and Vorley 2015), although it fails to take into account African contexts. Crisis situations in the context of Africa are not new as countries have had to deal with civil wars, terrorist attacks, political unrest, natural disasters, or even earlier pandemics such as Ebola. Kenya specifically has suffered from crises in the form of post-election violence, locust plagues, droughts, terrorist attacks by al-Shabab and the global financial crisis in the last fifteen years. Although limited research has been conducted on entrepreneurship and crisis management in African contexts, there are some exceptions around – for example – entrepreneurship and violent conflict (e.g. Brück *et al.* 2013), entrepreneurship and Ebola (e.g. Mbeteh *et al.* 2020), entrepreneurship and economic crisis (e.g. Lubell and Zarour 1990) and entrepreneurship and terrorism (e.g. Branzei and Abdelnour 2010), albeit not specifically considering women entrepreneurs.

Most entrepreneurship and crisis literature focuses on the individual entrepreneur and their business and how they can successfully respond to a crisis through defined skills such as proactivity, identification of opportunities, innovation, risk management, and resilience (Branicki *et al.* 2018;

Portuguez Castro and Zermeño 2020). In these studies, resilience is seen as the entrepreneur's ability or capacity to adapt to change (Salisu *et al.* 2020). However, in their literature review, Korber and McNaughton (2018) show how this only represents the first of six research streams on entrepreneurship and resilience: (1) resilience as traits or characteristics of entrepreneurial firms or individuals, (2) resilience as a trigger for entrepreneurial intentions, (3) entrepreneurial behavior as enhancing organizational resilience, (4) entrepreneurial firms fostering micro-level (regions, communities, economies) resilience, (5) resilience in the context of entrepreneurial failure, and (6) resilience as a process of recovery and transformation. While the first four research streams focus on resilience as an *ex-ante*, inherent characteristic of entrepreneurs and firms that helps them to prepare for potential crises, the last two research streams take a post-disruption view of resilience and explore what happens during and after a disturbance has occurred. This research adopts the sixth research stream and looks at "entrepreneurial resilience as a process of creative recovery, transformation and learning" (Korber and McNaughton 2018: 1132). This research stream is underpinned by the notion of adaptive resilience (see Martin 2012; Rose and Liao 2005) and focuses on the actions of entrepreneurs and their businesses during and after disruptions. In this way, "resilience is a dynamic process, not just a characteristic or property" (Martin 2012: 11). This is in line with a shift in entrepreneurial thinking from focusing on individual characteristics and intentions of entrepreneurs themselves towards concentrating on their actions and outcomes (Aldrich and Martinez 2001). Therefore, by analyzing the actions taken by agri-businesswomen in Kenya during the Covid-19 crisis, this research demonstrates their adaptive resilience in which different strategies resulted in different outcomes for business survival and growth.

Methodology

This article utilizes an online qualitative approach to examine how agri-businesswomen in Kenya have responded to the effects of Covid-19. Data was collected from July 2020 to October 2021 through online methods due to the Covid-19 travel restrictions. In the first phase of the research, the author looked for agri-businesswomen in Kenya by using the following criteria: (1) a Kenyan woman being the (co-)founder and (co-)director of the business, (2) the business employing other people, (3) the business being active in processing, transportation, marketing and/or sales in staple crops, horticulture and/or dairy value chains, and (4) the business being formally

registered as a limited company in Kenya. These types of entrepreneurs were searched through the author's networks gained from working as a development practitioner promoting women's entrepreneurship, as well as through online platforms, Google searches and snowball sampling. Table 1 summarizes the demographic characteristics of the twenty women entrepreneurs who fit the criteria and thus were included in this research. Almost half of

Table 1: Summary of demographic characteristics of entrepreneurs in the research sample (N = 20) Source: Own data collection 2019-2020

Age of entrepreneur	(#)	(%)	Business size[1]	(#)	(%)
21-30	2	10%	Micro	4	20%
31-40	4	20%	Small	9	45%
41-50	5	25%	Medium	3	15%
50+	9	45%	Large	4	20%
Sector[2]	(#)	(%)	Firm age (in years)[3]	(#)	(%)
Dairy	3	15%	Less than 2	4	20%
Fruits and vegetables	12	60%	2-5	4	20%
Staple crops	4	20%	6-10	6	30%
Mix	1	5%	10+	6	30%
Business management profile[4]	(#)	(%)	Target market pre-Covid-19[5]	(#)	(%)
Family business	13	65%	Export market	5	25%
Partnership business	3	15%	Domestic market	10	50%
Solo business	4	20%	Mix of both markets	5	25%

1 Kenya's official definition was used based on employment size: micro enterprises have fewer than 10 employees, small enterprises have 10-49 employees, while medium-sized enterprises have between 50 and 99 employees. Large companies have 100 employees and above. The use of the term "employment" here refers to the total number of people working in the business, whether they are partially, fully paid or not (KNBS 2016).

2 Staple crops in this research include sorghum, sweet potato, maize, rice, cassava, beans, and peanuts.

3 Firm age based on official registration date compared to the date of the interview.

4 Family business: spouse, children and/or other family members of the entrepreneur either co-founded the business or joined them later as a co-director, shareholder and/or employees. Partnership business: the entrepreneur co-founded the company with business partners outside the family. Solo business: the entrepreneur is both the sole founder and sole director of the businesses and in addition owns all of the shares themself.

5 Domestic markets include both local markets (e.g. selling to local schools) and national markets (e.g. selling to national supermarket chains).

the women are above 50 years of age and mainly operate what can be called family businesses that are active in the fruits and vegetables sectors in Kenya. Nonetheless, there are many variations, including in terms of the firm age and the types of markets targeted pre-Covid-19. Half of the women focused on selling to the domestic market pre-Covid-19, one-quarter were mainly focusing on export markets and the others sold to both types of markets.

In the second phase of the research, online semi-structured interviews were conducted in English with the agri-businesswomen via Zoom or WhatsApp. In addition to asking introductory questions about the history and organization of their business, two specific questions related to Covid-19 were asked: (1) "How are Covid-19 effects currently affecting your business?" and (2) "Have you taken any measures to deal with the effects of Covid-19?" In addition, in the months that followed, the author checked in with the entrepreneurs through email, WhatsApp chats and in some cases WhatsApp phone calls. All verbal communication was recorded, transcribed, and assigned to the women's individual cases in NVivo (qualitative data analysis software). Data from the direct communication with the entrepreneurs was triangulated with data from other online sources such as company websites of the women entrepreneurs, news articles and videos that had previously covered the stories of the women entrepreneurs, social media posts by the women entrepreneurs themselves and government announcements around the measures taken in response to Covid-19. For example, when an entrepreneur mentioned a particular government measure affecting her business, this information was compared to government announcements to check its credibility.

In the third phase of the research, the author coded all transcripts in NVivo using an inductive approach. This led to identifying six main themes (see Table 2): (1) international and Kenyan government measures, (2) employee and farmer management, (3) product offering and customer relations (4) partner relations, (5) money management, and (6) family management.

Table 2: Covid-19-related themes as mentioned by the research sample (N = 20)

Covid-19-related themes	Theme mentioned by % of sample	Illustrative quote[6]
International and Kenyan government measures	55%	"The government has been helpful in a way because they reduced the cost of VAT for us from sixteen percent to fourteen percent, in a small way of course it was helpful." (interview agri-businesswoman, 26 October 2020)
Employee and farmer management	85%	"I could not send my people [employees] home. What we have arranged and what we agreed is to reduce the income by about 40 percent which was quite okay with them until when the business picks up again." (interview Alice M., 16 December 2020)
Product offering and customer relations	95%	"We used to sell fermented milk to high class hotels, like the Indian restaurants. They closed down so definitely that affected us largely, because they were the [biggest] consumers of our processed dairy products." (interview agri-businesswoman, 4 January 2021)
Partner relations (e.g. membership organizations, NGOs, other entrepreneurs)	50%	"Attending forums on Zoom for organizations that we belong to that assist women in business, just to learn how to maneuver this period of COVID and see how we can get out of it without really going under." (interview Purity, 13 November 2020)
Money management	60%	"We applied for that moratorium [delay in payment to banks] because of course, low sales affected our cash flow. And so that six months period they've given us on the loans that we have with them has also helped quite a bit." (interview Purity, 13 November 2020)
Family management	45%	"I'm in the office with my young boy. All the time, I'm with my boy, even if I go outside to the field to visit the farmers. I just carry him on my back and go." (interview Askah, 20 November 2020)

Based on the analysis, a preliminary timeline of the Kenyan government measures was constructed, along with an overview of how this positively and negatively influenced the other themes. In addition, a preliminary overview of the different adaptive resilient strategies per theme was constructed. These preliminary findings were presented back to the agri-businesswomen and discussed with seven entrepreneurs in two online focus

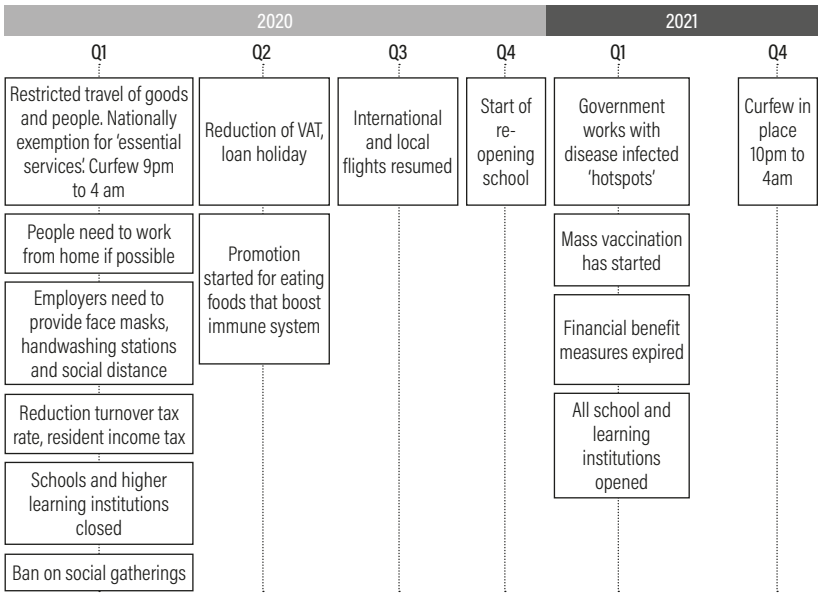
6 Names of entrepreneurs are only used when they have given prior written consent. In all other cases, the quotes and stories are anonymized.

group discussions using Zoom. These group discussions provided an opportunity for the research respondents to verify and validate findings, which enabled more nuanced and better-grounded conclusions. The transcripts from these discussions were again coded, analyzed, and used to enrich the results presented in this article.

Covid-19 in Kenya

Covid-19 was confirmed to have reached Kenya on 13 March 2020. In the same month, the government of Kenya announced a series of nationwide restrictive measures in an attempt to contain the number of infected people. Figure 1 summarizes the most relevant government measures taken over a period of 1.5 years. Although this is not an exhaustive list, these are the measures that directly affected the businesses of the agri-businesswomen included in this research.

Figure 1 - Covid-19-related government measures taken in Kenya



In March 2020, the government of Kenya restricted travel from any country with any case of Covid-19. Kenyan citizens were allowed to enter the country if they could self-quarantine or if they resided in a government-designated quarantine facility. Cargo vessels, airplanes or ships could enter the

country provided they were disinfected at the point of departure and the crew quarantined on arrival. A nationwide night curfew from 9 pm to 4 am was announced and the government ordered people to start working from home, with an exception for those working in essential services. Those working in the agricultural and manufacturing sector – including those in food and farm produce processors and distributors – were listed by the Kenyan government as essential service providers. Employers were required to take the necessary precautions such as providing employees with face masks, installing hand washing stations and maintaining social distancing between workers. On the financial side, cashless transactions over cash transactions were encouraged. The government announced a reduction of the turnover tax rate from 3 percent to 1 percent for all SMEs. The resident income tax was reduced from 30 to 25 percent and a 100 percent tax relief was announced for Kenyans earning KES 24,000 and below. Family life was strongly affected as all public and private schools and higher learning institutions were closed as of 20 March 2020, which increased the time that mostly women spend on unpaid care work. Finally, community life was affected due to the ban on social gatherings, which included congressional meetings such as weddings, malls, night clubs, churches and even a limitation of visits to hospitals. In April 2020, additional financial measures were announced such as the reduction of VAT from 16 percent to 14 percent and the temporary suspension of the listing of loan defaulters. The Central Bank of Kenya also lowered their bank rate from 8.25 percent to 7.25 percent. As of June 2020, the government started a campaign around eating healthy foods as a way to boost the immune system and therefore beat the Covid-19 pandemic.

In July 2020, the first measures were lifted such as the cessation of movement in and out of Nairobi, while local air travel also resumed. A month later, in August 2020, international air travel also resumed. In October 2020, Grade 4, Class 8, and Form 4 students reported back to school in the first part of the progressive reopening of schools. In January of the next year, all other classes and learning institutions were reopened. The government of Kenya decided to start working with so-called "disease infected hotspots" as of March 2021. Stricter measures were applied in these hotspots compared to the rest of the country and the hotspots could change over time depending on the infection rates in a county. The financial benefits that had been announced a year earlier expired in March 2021. Around the same time mass vaccination commenced. The government of

Kenya also released another Covid-19-related campaign, this time focusing on increasing the number of people being vaccinated against Covid-19. As of October 2021, the nationwide curfew was lifted. In the first few months of the pandemic, the government measures were heavily enforced – especially in urban areas – through the use of mandatory quarantine, instant fines or even jail time for not obeying the rules, as well as the establishment of a Special Enforcement Unit by the national police and national and county governments. This strictness in enforcement slowly relaxed over time as several political leaders were accused of hypocrisy due to still organizing political rallies across the country.

Impact of Covid-19 on Kenyan Agri-Businesswomen and their Short-Term Response

Covid-19 and the related government measures affected the lives of the entrepreneurs at multiple levels. One agri-businesswoman commented: "Everything changed. It [effects of Covid-19] changed our social lives. We changed our family life, changed our spiritual life. It's changed our business life" (Margaret in Group discussion 2, 1 September 2021).

In late March 2020, due to the government measures, sales to important local, national and international markets of the agri-businesswomen were significantly reduced. International and national restaurants, schools and hotels reduced or even closed their business, which affected the agri-value chains in which the women participate. Governments of countries in America, Africa, Asia, and Europe either closed their borders or made the process of importation much more difficult. Freight prices (via both air and water) significantly increased. Like the export market, the domestic market also changed instantly when the government measures in Kenya were announced. Spurred on by the nationwide curfew and the advice to stay at home as much as possible, customers stayed away from Kenyan supermarkets out of a fear of contracting Covid-19. Agri-businesswomen's businesses suffered heavy revenue losses as a result, according to their own claims. On the supply side of agri-businesses, according to the agri-businesswomen, Covid-19 affected the quantity and quality of the raw produce supply. Due to import restrictions, farm inputs became more expensive and fuel prices increased. This resulted in farmers not being able to produce as much as they used to pre-Covid-19. This limited the production capacity of the agri-businesswomen. Normally the agri-businesswomen pride themselves in maintaining good farmer relations in the form of physical group

training sessions and farm visits. However, due to Covid-19 restrictions and in an attempt to limit operational costs, farmer training sessions and visits were reduced.

Respondents reported that the cost of doing business in general went up. The increased fuel prices, the national curfew, and the cessation of movement between Kenyan counties all contributed to increased transportation costs of products. They also reported that the legal requirement to provide employees with personal protective equipment such as face masks and handwashing stations also increased the costs of operations. The abrupt changes in state regulations, the irregular supply of raw materials and the increased costs of operations prompted most agri-businesswomen to decide to reduce the number of casual workers at their farms and factories. The "adaptive strategy" of agri-businesswomen in Kenya of laying off casual workers thus reduced the adaptive capacities of "other" (read: low-class, non-business) women in Kenya. Saliently, the government measures dictating social distancing to be maintained between employees' workstations provided agri-businesswomen with a legitimate reason to reduce the number of workers. Put differently, the fact that the respondents were running formally registered businesses and were thus under more strict surveillance of legal measures compared to the informal businesses in Kenya meant that they had to more strictly enforce government regulations. Casual workers in Kenya's agricultural sectors are often low-class, non-businesswomen who perform informal and low-skilled jobs. Casual workers being the first to be laid off thus affected women more than men. As opposed to the casual workers, the women decided to reduce the costs of permanent staff. This involved reducing their pay by a certain percentage for the time being or them taking as many of their remaining leave days as possible. Of course, not all employees accepted their pay cuts, which caused more tension for the women entrepreneurs on the employee management side. Other short-term responses to deal with human resourcing costs involved changing the payment strategy by – for example – basing salaries on retainers and providing bonuses based on performance indicators.

On the positive side, most women and their employees who remained in the business were allowed to partly work during lockdown as they are part of the "essential service" sector. A difference was observed in the entrepreneur's age categories, whereby those entrepreneurs about 60 years and above were categorized by the government as being at risk of contracting Covid-19 and had to work from home. This was a source of stress, with one

of the entrepreneurs above 60 years old stating: "When you're in agri-business you're that character who wants to be in the field to work with people, to talk with people, to interact with them. Being indoors is punishment" (Alice K. in Group discussion 2, 1 September 2021). However, after a while, some of the agri-business entrepreneurs also saw these additional hours spent at home as an opportunity and started to plan and strategize. For many, this involved conducting market research or piloting new products, as will be discussed in Section "Long-Term Adaptation Strategy: Changing Target Markets". Several entrepreneurs also invested in their own human capital by attending online training sessions that would not have been available to them if they had been organized in a physical place (see Section "Long-Term Adaptation Strategy: Going Digital").

Nonetheless, the first few months of Covid-19 was a period of uncertainty and increased stress. It resulted in immediate cash flow issues due to the reduced sales, limited production capacity and an increase in operational costs. The poor financial numbers for 2020 will only exacerbate the well-documented challenge of gaining access to finance for a woman-led agri-business (e.g. Kyalo and Kiganane 2014). Some of the women entrepreneurs temporarily closed down their business, while others kept running at reduced capacity. One entrepreneur commented on this period: "Even you yourself [as an entrepreneur] it's like you're also laid off because you're closing. So a lot of it felt like a standstill. You go back and feel like you're starting all over again" (Elizabeth T. in Group discussion 1, 26 August 2021). On top of the stress stemming from general business management, the women's stress was increased by their increased caring responsibilities. In Kenya, the schools closed on 20 March 2020, and gradually started opening up from October to December in the same year. This meant that children were staying at home for at least seven months, and the caring responsibility in Kenya culturally still mainly lies with women. Accordingly, agri-businesswomen with school-aged children had to combine running their business with ensuring that their children's education progressed. The women responded by bringing the children of friends or family members together and either took them along to the farm or office, or they jointly hired a tutor to work with them. Women with grown children also spent more time on unpaid care work. Some entrepreneurs took in their grandchildren, while one entrepreneur's son lost his job due to Covid-19 and he moved back in with his parents. For others, the stress was caused by the social distancing norms and children being advised to not

visit their elderly parents as often. There was also the case of an agri-businesswoman losing a close family member to Covid-19. In addition, many of the agri-businesswomen would normally hire help in the household to reduce the time spent on washing, cleaning, and cooking. However, during Covid-19, these responsibilities were taken on by some of the entrepreneurs themselves again to limit the risk of the hired help spreading Covid-19 in the household. These household-related impacts of Covid-19 caused considerable mental stress, but did not force the women to stop running their businesses. In fact, quite the opposite, in order to ensure that their household has a steady flow of income – including in times of crisis – most women have other sources of income to stabilize their business. This strategy of working side jobs was already in place but was further leveraged in times of Covid-19. Despite these short-term responses, the majority realized in this period that "if we don't take a quick turnaround, our business would actually crash" (Mercy in Group discussion 1, 26 August 2021).

Long-Term Adaptation Strategy: Changing Target Markets

Covid-19 has prompted twelve out of the twenty agri-businesswomen to diversify their products while at the same time changing their target market from a focus on export to domestic markets, export markets to other export markets, or domestic markets to other domestic markets (see Table 3). Most of this group (eleven out of twelve entrepreneurs) decided to focus more on the domestic market because the local demand for fresh and healthy food products increased due to Covid-19 and customers were diverting from their regular channels to buy their products. People were staying at home during lockdown, cooking for themselves and becoming aware of the role of healthy foods in boosting the immune system. This awareness was amplified by the messaging of the Kenyan government around nutritious foods as a way of combating Covid-19. Moreover, customers were looking for ways to source food products directly, out of a fear of being infected with Covid-19 when visiting crowded open markets and supermarkets. Despite these changes, eight out of twenty women decided not to diversify their products and not change target markets. These four different adaptation strategies related to the women's target markets resulted in different outcomes for business survival and success and will be discussed by providing exemplary cases for each.

Table 3: Overview of target market change during Covid-19 by number of entrepreneurs (N = 20)

Adaptation strategy related to target markets	Number of entrepreneurs with pre-Covid-19 target market			Total number of entrepreneurs
	Export	*Domestic*	*Both*	
Export to domestic	2	0	3	5
Export to other export	1	0	0	1
Domestic to other domestic	0	6	0	6
No change	2	4	2	8

Export to Domestic Markets

Mercy Mwende registered her company Sweet N Dried in 2009 and her husband became co-director when they got married around the same time. Pre-Covid-19 government measures, Mercy was focusing on exporting bulk orders of dried fruits and vegetables to international customers in the export market. In addition, she was selling to Kenyan supermarkets through both third-party distributors and her own two distribution outlets located in Chuka town in Tharaka-Nithi county in Kenya. Her business grew to a point where she was sourcing from around 2,000 smallholder farmers and employing around thirty employees when Covid-19 was confirmed to have reached Kenya on 13 March 2020 (interview Mercy Mwende, 29 July 2020). During the first few months of lockdown, while she was staying in the house with her family, Mercy started receiving many inquiries from Kenyans who were panicking and trying to stock up on dried fruits and vegetables. People were looking for something that is both healthy and does not perish easily, as nobody could predict how long the lockdown would last. The increasing demand intrigued Mercy and she started conducting market research looking for a combination of ingredients that could best boost immunity. In July 2020, she gathered her team together to come up with a product that would reach low-income Kenyan customers with an affordable product to address the increased need for nutrition. Based on the market research that they performed, they decided to create an affordable porridge and fortify it with the fruits and vegetables of Sweet N Dried. In August 2020, she and her team worked with international consultants in food science and nutrition to create the new formula. By December 2020, the product was ready, certified by the government and ready to be sold. With this new product – called Cham Booster Porridge – Mercy targets

low-income consumers in Kenya. It has been received so well that her business model changed from depending on 80 percent exports and 20 percent local market to 20 percent exports and 80 percent local market. According to Mercy, this focus on the domestic market is a permanent change to her business model. It enables her increased control by reaching her end customers directly instead of having to rely on the business growth of her clients such as supermarkets.

Not all agri-businesswomen took this strategy of selling directly to Kenyan consumers when moving their focus from exports to the domestic market. For example, Margaret Komen started selling her chili powder to larger processing companies in Kenya that were struggling to access their raw produce from India due to import restrictions. By solving their sourcing problem and even co-creating new product lines, she hopes to create a sustainable business relationship that will remain after the borders open up again, while at the same time trying to maintain her export market activities (interview Margaret, 6 October 2020; Margaret in Group discussion 2, 1 September 2021). For the entrepreneurs who adopted the "export to domestic" strategy, Covid-19 has provided new markets that otherwise would have been more difficult to enter, as they would have had to compete with imported products.

Export to Other Export Markets

Alice Mugo registered her business – Spring Fresh Growers and Exporters – in 2011 together with her husband. Prior to the Covid-19 government measures, she was selling her fruits and vegetables mainly to export markets in Germany, Norway and Qatar. In December 2020, nine months after the first government measures were announced in Kenya, she shared:

> "I'm selling to the export market. But Coronavirus, it has taught us that we need to expand into the local market which we are working on. We also are planning to launch our products locally because it is also coming to us that the local market is also a huge market and it is well organized in terms of the products that are in need" (interview Alice M., 16 December 2020).

However, in the months that followed, Alice found it difficult to find Kenyan customers for her produce. She was trying to target Kenyan supermarkets but reported that several of the large chains such as Uchumi, Nakumatt, and Tuskys were facing financial difficulties or had even filed for bankruptcy in

recent years. This means that the competition is fierce to gain orders from the remaining supermarkets. She considered selling directly to her customers at the farm gate but feared that this business model would not make sense due to the reduced purchasing power of people in Kenya. She shared:

> "People want lots of produce for little price. Lots of produce, but I don't benefit from it because they want to pay less because they're coming to buy it from the farm. So I mean the purchasing power, it's not sustainable. [...] we are only banking now on the opening up of the nation" (WhatsApp call Alice M., 22 June 2021).

While waiting for the borders of Norway and Germany to open up, she tried to sell her avocados and fruits to a new client in the Maldives, but she never received any payment. This caused additional stress as she had to hire a lawyer to ascertain whether the money could still be retrieved. She shared about this experience:

> "Business is risky at the moment. For new customers it's risky. And for new businesses we are asking for a certain payment, before we do a shipment and big companies don't want that. And you don't know which big company is surviving at this moment. Every big company, small company is struggling. So we just have to tread carefully" (WhatsApp call Alice M., 22 June 2021).

Fortunately, throughout the crisis she was able to keep selling to her customers in Qatar, which sustained the business through the most difficult times while she was losing a lot of money. This period has taught Alice the importance of having proper procedures and financial habits in place to prevent fraudulent deals and overcoming suddenly-imposed government restrictions on traveling and transport (in this case in relation to Covid-19).

Domestic to Other Domestic Markets

Askah Nyakwara started Nyangorora Banana Processors Limited (NBP) with a group of fifteen women banana farmers. Pre-Covid-19 government measures, NBP was sourcing bananas from five hundred women farmers and selling mainly bread, energy biscuits and crisps – all made from bananas – to local schools. She shared in November 2020: "Now the schools have been closed down. We don't have the market. It has really affected us 90 percent" (interview Askah, 20 November 2020). Askah and her team

diversified into making wine out of the bananas and selling them online to men in Nairobi. At the same time, she was trying to sell her banana crisps and energy biscuits directly to women and small children in Kisii county, where she is located. The increased local demand for healthy foods also prompted new players to enter the domestic market. Middle-income earners who had been laid off their jobs converted their large vehicles into mobile groceries. This created a new market outlet, which meant that healthy foods became more widely accessible. However, the local demand did not increase for all healthy food products. The director of a dairy company which diversified into creating a probiotic yogurt during Covid-19 explained:

> "The consequences of Covid-19 affected the economical factor of Kenyans. If you have to choose between vegetables and yogurt, I see the majority of the people will go for the vegetables, because with vegetables it can give you a meal, but yogurt is more like... I think for lack of a better word it is considered more of a luxury drink. [...] Our drink is probiotic, so lots of Kenyans are not very familiar with the probiotics. It has to do a little bit with more education and sensitization slowly by slowly before they open up to this" (agri-businesswoman in Group discussion 1, 26 August 2021).

People wanting affordable but basic healthy foods that fit into their staple dishes relates to lower disposable incomes and food habits. In times of crisis, customers are less willing to spend money on items that are not essential and those that they are not used to. Whether changing to other domestic markets leads to better business outcomes is thus very dependent on the type of product being sold.

No Change in Target Markets

Two adaptation strategies could be distilled within the group that chose to not change their products and target markets: (1) Covid-19 government measures are hurting their business but they choose to wait until things return to normal, and (2) Covid-19 government measures are providing a great opportunity to increase sales of current products to the current market.

Purity Naisho – the founder and director of Interveg Exporters Limited – chose the former strategy. Prior to Covid-19 government measures, Purity was mainly exporting green beans, sugar snaps and snow peas to customers in Europe. Only the produce that did not fit the export quality standards

were sold to local middlemen in Kenya. In November 2020, Purity's sales were down by 60 percent as it became much more difficult and expensive to ship out her products. Instead of changing her products or changing her target markets, Purity has tried to reduce her costs and was hoping that things would return to normal after the first Covid-19 wave in Europe ended around June 2020. She shared:

> "As we were just breathing a sigh of relief and saying okay now at least we are getting to the high season we'll be able to recover by selling the volumes that we normally sell around this time then there was the second wave in Europe. [...] The flights are coming in and going out. The only thing is the fact that restaurants are closed. Our customer in the Netherlands, all restaurants are closed. We always monitor this because it really affects because a lot of them also sell to the restaurant. So that again, affected the demand" (interview Purity, 13 November 2020).

Even though international flights from Kenya resumed in August 2020, Purity's business was still suffering due to the restaurants in her European target markets being closed. She remained hopeful that this would change as she was in regular contact with her European clients about how the Covid-19 infections were progressing in their countries. She shared: "It's been a wait and see situation on a daily basis. A day at a time" (interview Purity, 13 November 2020).

On the other hand, another agri-businesswoman has seen her sales increase during Covid-19 and hence she has not changed her products or target market. She is selling flour, crisps and starch – all made from cassava – to urban slum dwellers and middle-income customers in Nairobi. As she was selling through local shops, kiosks and convenient stores that did not have to close in lockdown, she did not experience many negative effects for her business. Moreover, she believes that the lockdown measures contributed to her increased sales:

> "So I think people have discovered they can eat, first of all, most of the people's budgets are kind of tight. So that means there's no more eating at restaurants and apart from that there was the restaurant closure, so many people are eating at home. And they've also realized that, the government is encouraging people to eat healthier foods. I think that's how the sales have increased" (interview agri-businesswoman, 9 October 2020).

Next to her, only one other entrepreneur reported an increase in sales without changing the product or target market. The remaining five entrepreneurs adopted the same strategy as Purity and tried to wait the crisis out while trying to limit their costs. Selling directly to Kenyan consumers was a viable adaptation strategy for many of the entrepreneurs, given that they are selling an affordable, healthy product that fits into the daily diet of Kenyans. To enable this change in target markets, several entrepreneurs had to adopt new digital innovations in their marketing and sales.

Long-Term Adaptation Strategy: Going Digital

Due to Covid-19-related restrictions, half of the agri-businesswomen adopted digital innovations that they were not using prior to Covid-19 to keep their businesses afloat. These digital adaptation strategies were implemented for improving marketing and sales, employee and farmer management, money flows, fundraising and general relationship management (see Table 4).

Table 4: Overview of new digital innovations adopted during Covid-19 by number of entrepreneurs (N = 20)

Adaptation strategy related to new digital innovations in..	Implemented by number of entrepreneurs
Customer relations	7
Employee and farmer management	3
Money management	3
Partner management	6

When marketing and selling to Kenyan customers directly, the seven agri-businesswomen who adopted digital innovations started to use digital marketing channels such as WhatsApp, Facebook and phone calls to receive orders and direct home deliveries and postal delivery to get the products to their clients. For example, Mercy started a Facebook page for Sweet N Dried in June 2020, opened a web shop for her products on her company website and added automated marketing messages to her WhatsApp. Through these channels, she sold – for example – pumpkin flour, sweet potato, arrowroot flour and started sending them through postal delivery to people's houses. Apart from marketing these products, Mercy also used her Facebook page to share recipes, show interactions with farmers and from

December 2020 onwards she promoted her new booster porridge called Cham. Where Mercy used postal delivery to get her products to clients, other agri-businesswomen used their own trucks and drivers. To overcome minimal order purchases, customers started grouping themselves together into WhatsApp groups, allowing entrepreneurs to create delivery schedules stipulating the delivery areas and dates so that products could be sold in bulk and distribution costs could be minimized. Thanks to special stickers that represented a special permit to deliver essential services, distributed by membership organizations that could be placed on their trucks, entrepreneurs were able to distribute products past the curfew and between Kenyan counties without getting in trouble with the police.

Due to Covid-19 lockdown measures communication with employees and farmers also became more digitized. Pre-Covid-19, the agri-businesswomen would meet with farmers in large groups of around 60 people. Now, several entrepreneurs communicate mainly digitally through group structures. For example, one entrepreneur appointed one contact person per locality. Using a calling tree, she only calls these locality contact persons who subsequently text or call several others, who in return pass the message onward. Another entrepreneur established an Unstructured Supplementary Service Data (USSD)[7] code that the farmers used to register. This allowed them to easily access information and for the entrepreneur to send bulk text messages. The entrepreneurs reported not using Zoom meetings and WhatsApp often in farmer management as internet access in rural areas is not always guaranteed. Zoom meetings were used instead by some entrepreneurs to enable employee management without face-to-face meetings.

At the start of the Covid-19 lockdown measures in Kenya, the government of Kenya asked M-PESA – Kenya's mobile wallet company, owned by Safaricom – to consider reducing costs of transactions to allow customers to use cashless modes of payment considering restrictions on movement and reducing physical contact. The M-PESA mobile money service – which allows users to send and receive money via a simple SMS message – was already used by the vast majority of Kenyans pre-Covid-19 (Suri and Jack 2016). In March 2020, M-PESA decided to waive mobile transaction

7 USSD allows users to create a real-time connection from their mobile phones by making selections from various menus. In contrast to regular SMS, USSD enables two-way communication of information nearly instantaneously.

costs for 1,000 KES and below. Another service of M-PESA that became very popular among Kenyan customers during Covid-19 is Fuliza, which allows customers to pay for products when they have insufficient funds in their M-PESA account. These developments helped boost online sales for some of the agri-businesswomen, especially in the first year of Covid-19. Another digital strategy that helped to solve cash flow issues was digital fundraising. At the start of 2021, Mercy started an online crowdfunding campaign to procure a milling machine and a ribbon mixer that would help to increase the production capacity to meet the demand for her new Cham Booster Porridge. At the end of the campaign, on 12 June 2021, she had raised over 1 million KES (approximately 9,000 USD).

Many of the agri-businesswomen were traveling a lot pre-COVID, visiting international customers, conferences, and training programs. Organizations started hosting their events and training sessions online. Membership associations and NGOs provided many training programs online, which helped the women in diversifying their products, improving their financial management and maintaining general linkages with other women entrepreneurs. Six women reported how Covid-19 has made them realize how much money and time they were spending on trips that could have been dealt with online.

Discussion and Conclusion

This article has demonstrated the adaptive resilience of African women entrepreneurs amidst a national crisis, using Covid-19 as a recent example of crisis. It has analyzed different adaptive resilient strategies taken by Kenyan agri-businesswomen, which resulted in different outcomes for business survival and growth. Covid-19 and the related government measures in Kenya affected the lives and businesses of the agri-businesswomen at multiple levels. The entrepreneurs responded to the heightened transportation costs (both to export and domestic markets), the reduced supply of raw produce, the increased operational costs due to buying staff personal protective equipment, and the reduced sales due to markets closing by reducing the number of casual workers, changing the payment structures of employees and farmers, and working side jobs to ensure a steady flow of income into the household. In their family life, they dealt with the additional care tasks – due to the school being closed for seven months – by bringing the children of friends or family members together and taking them along

to either the farm or office, or they jointly hired a tutor to work with them. After the initial shock of lockdown had subsided, the women started to use their extra time at home to plan and strategize, which led to different adaptive resilience actions being taken. More than half of the agri-businesswomen chose to diversify their products while at the same time changing their target market from a focus on export markets to an increased focus on domestic markets, from export markets to other export markets, or moving from domestic markets to other domestic markets. The others decided to not diversify their products and not to change target markets because either Covid-19 government measures were hurting their business and they chose to wait until things went back to normal or Covid-19 was providing a great opportunity to increase sales of their current products to their current market. Covid-19 has provided new markets that otherwise would have been more difficult to enter as they would have had to compete with imported products. It has also taught entrepreneurs the importance of having flexible procedures and financial habits in place to prevent fraudulent deals and overcoming suddenly-imposed future government restrictions on traveling and transport. Selling directly to Kenyan consumers was a viable adaptation strategy for many of the entrepreneurs, given that they are selling an affordable, healthy product that fits into the daily diet of Kenyans. In times of crisis, customers are less willing to spend money on items that are not essential as well as items that they are not used to. Customers were also trying to buy more directly from companies as they were trying to avoid crowded sales channels such as supermarkets and open markets. To enable this change in target markets, half of the entrepreneurs adopted new digital innovations in their business operations. These digital adaptation strategies were implemented for improving marketing and sales, employee and farmer management, money flows, fundraising and general relationship management. Even though different adaptation strategies to Covid-19 seemed to reap different results for the agri-businesswomen in terms of sales, to the author's best knowledge, none of the businesses went bankrupt during Covid-19.

This article makes three contributions to the existing literature on resilience and entrepreneurship. First, most studies have focused on entrepreneurship and crisis management in Western countries, whereas limited research has been conducted in African, Asian and Latin American contexts, especially on how women entrepreneurs respond to external crises. Responding to these two main shortcomings in literature, this article has

uncovered how women entrepreneurs in an African context – in this article, Kenya – have responded to Covid-19 lockdown measures. Second, entrepreneurship and resilience literature mainly focus on resilience as an *ex-ante*, inherent characteristic of entrepreneurs and firms that help them to prepare for potential crises, but it rarely discusses the scope of conditions or contextual circumstances under which the construct or entrepreneurial resilience applies (Korber and McNaughton 2018). Even when studies have adopted a post-disruption view of resilience and explore what happens after a disturbance has occurred, they mainly focus on economic downturns rather than other types of crises (Korber and McNaughton 2018). By constructing the timeline of measures taken by the Kenyan government in response to Covid-19 – a global pandemic – and capturing the practical entrepreneurial responses of the Kenyan agri-businesswomen, this article contributes to better understanding adaptive resilient responses within a particular historical, spatial and social context (Welter 2011). Third, in line with Folke (2006) and Smit and Wandel (2006), it has been shown that disruptions are not only negative considering entrepreneurial resilience. Indeed, Covid-19 has opened free spaces and opportunities for some of the entrepreneurs to creatively explore and experiment with new products, target markets and digital innovations.

The research faces a number of limitations that could translate into future research opportunities. First, in this article the business survival of all firms and sales growth of some of the firms were used as a positive outcome of adaptive resilience. However, as highlighted by Korber and McNaughton (2018), stopping entrepreneurial activity completely in the light of emerging challenges could actually be judged as more resilient as this requires a high degree of self-awareness, critical reflection and learning at the individual level. Considering a more holistic definition of positive entrepreneurial outcomes related to resilience could be the topic of future research. Second, although this article has explored how the women entrepreneurs were affected by their specific contextual circumstances and the actions that they took, it has not considered how the adaptive resilient responses of the women entrepreneurs have contributed in turn to "socio-economic transformation and sustainability in their environment" (Korber and McNaughton 2018: 532). Finally, it seems that focusing on the local market – as opposed to waiting for the export market to open up – with an affordable, nutritious, staple food as opposed to a new, more luxurious food product was the most viable adaptive resilient strategy.

However, it is too soon to tell whether this still holds true when Covid-19 restrictions are lifted in Kenya and other parts of the world. It remains unclear how long the Covid-19 crisis will last and what the long-term effects will be on the business sector in Kenya. Exploring resilience in the context of crises could benefit from longitudinal research designs that track resilience as it unfolds (McNaughton and Gray 2017).

Acknowledgments

My gratitude goes out to the entrepreneurs who participated in this research. Their willingness to openly share their stories is what made this research possible. I also thank my PhD supervisors Annelies Zoomers, Griet Steel and Janwillem Liebrand for reviewing and providing feedback to the article. Finally, I thank 2SCALE – an agri-business development program in Africa funded by the Ministry of Foreign Affairs of the Netherlands – and Bopinc – a Dutch Foundation and the employer of the author at the time of the research – for their financial contribution to this research.

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Chapter Four

From Fear to Resilience: An Inquiry into East African Innovations during the Covid-19 Pandemic

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Abstract
In this paper, we explore two popular medically-inspired innovations in Kenya and Tanzania during the Covid-19 pandemic to illustrate how a newly identified infective agent triggered collective, top-down, targeted, and repurposed innovations in the East African context. We point out the key determinants in the development and adoption of new approaches during the Covid-19 crisis and illuminate the collective processes of emotional regulation and social support that led to collective adaptation and ultimately, resilience. Our findings contribute to the growing body of literature on entrepreneurial resilience.

> "When I saw what China had to do to isolate an enormous part of their population, my first thought was Africa. How in the world are they going to deal with this? I have been in townships all over Africa, and slums. When we talk about in our country [United States of America], physical distancing and then handwashing, if you live in a slum, you can't physical distance, you have to go out and get your meal, you don't have clean water to wash your hands, and so as soon as I saw that, and I know from the foundation's work how quickly disease spreads, I thought, oh my gosh, we have a crisis on our hands that we aren't even talking about..." (Melinda Gates, CNN Interview 2020)

Introduction

In March 2020, when the World Health Organization declared that the progress of the novel coronavirus (Covid-19), amounted to a global pandemic (Musa *et al.* 2021), various individuals and organizations expressed their fear that African countries would be unable to respond to it effectively. The United Nations Commission for Africa (UNECA), for its part, predicted that the pandemic could claim anywhere from 300,000 to 3.3 million lives in the continent (2020). Indeed, the Covid-19 pandemic revealed staggering healthcare inequalities between developed and developing countries. For example, most African countries lacked adequate critical care facilities to address the effects of Covid-19 (Craig *et al.* 2020). A Reuters survey found that there was fewer than 1 intensive care unit (ICU) bed per 100,000 people in the continent at the onset of the pandemic; countries like Nigeria and Ethiopia, with approximately 200 million and 115 million inhabitants respectively, possessed only 350 ventilators each while Djibouti had no ventilators for its 1 million inhabitants (Houreld *et al.* 2020). All the same, the doomsday predictions for Africa were the subject of contested debate, online and in person. Journalists like Okereke and Nielsen of Aljazeera cautioned against predicting the apocalypse in Africa, pointing out that such predictions were based on the simplistic presumption that African countries would be "passive victims" of the pandemic (2020). Instead, many African countries implemented various public health measures to curb the effects of the virus. Kenya, Uganda, and South Africa, for example, instituted nationwide lockdowns at the beginning of March 2020 (Stiegler and Bouchard 2020). Still, the global effects of the pandemic, including in Africa, are undeniable with as many as an estimated 6.3 million people across the world losing their lives to Covid-19, 254,000 of them in Africa (WorldOmeter 2022).

In addition to the humanitarian effects, the pandemic had devastating economic effects (Kuckertz *et al.* 2020). It is estimated that Covid-19 had led to an 8.8% loss of global working hours amounting to approximately 255 million full-time jobs, pushing more than 119 million people into poverty in 2020 alone (CSSA 2021). Supply chain disruptions (Zhu, Chuo and Tsai 2020), trade stagnation (WTO 2020) and other economic effects of the pandemic led to the failure and closure of many entrepreneurial ventures (Donthu and Gustafsson 2020; Shepherd 2020). Moreover, the pandemic had a detrimental social impact– increasing food insecurity

and reversing progress on healthcare and human rights thus setting back human development by decades (CSSA 2021).

Despite the severe effects of the Covid-19 pandemic, it also sparked many medical and non-medical innovations across the continent. For example, Oppong, Dadson and Ansah (2022) found that in the fight against Covid-19 African countries developed and adapted new technologies; they also creatively repurposed old technologies. Many innovators came forward with inventions. In Senegal, "Docteur Car" (Dr. Car Robot) was developed to deliver medications and take simple tests such as body temperature and blood pressure without human interaction (France24 2020). In Kenya, a 9-year-old created a foot-operated handwashing machine to dispense both water and soap (Wamukota 2020). Nigeria's iQube Lab developed My Service Agent, powered by AI and interactive voice response to meet the demand for communication from thousands of callers at the Nigerian Centre for Disease Control (Adepoju 2020). In Tanzania, herbal treatments such as CovidOL were created despite criticism of their hurried adoption (Kombe 2020).

In this chapter, we shall draw from the literature on entrepreneurial resilience in adversity and fear, to explore how the Covid-19 pandemic triggered innovation in the East African context. We shall look specifically at how the individual and societal vulnerability to the crisis triggered positive reactions from entrepreneurs who created new firms or novel products within existing firms using their capacity for innovation. We view innovation as an entrepreneurial action which involves the creation of new products or processes (Schumpeter 1934). As examples of innovations to curb the health effects of Covid-19, we propose the Tiba-Vent, a low-cost mechanical ventilator invented by fifteen university students from Kenya; and the Cubic Bupiji Sauna for steam inhalation treatment which was invented by George Buchafwe of Star Natural Products from Tanzania. These two case studies help illustrate the different types of innovation that resulted from the pandemic, namely, collective innovation, top-down innovation, repurposed innovation, and targeted innovation. This chapter, although small in scope, illuminates the process of transformation from fear to innovation, adding to the growing literature on entrepreneurial resilience. The chapter highlights the critical role of social support in the emotional regulation that allows for proactive behaviour, as well as the importance of institutional support in enabling innovators to actualize their ideas promptly.

Framework for Fear and Entrepreneurial Resilience in Adversity

Varied literature explores the ongoing impact of the Covid-19 pandemic on entrepreneurship. Kuckertz *et al.* (2020) found that the lockdown measures instituted by various countries to minimize the spread of the virus threatened the survival of innovative start-ups and that the spread of the virus would probably derail their potential for innovation despite efforts to support them. Several scholars predicted that the effects of the pandemic on entrepreneurship would be very severe (Liñán and Jaén 2020), and many entrepreneurial firms were indeed forced to shut down (Alessa *et al.* 2021; Fubah and Moos 2022). Concerned with ventures' survival, Giones *et al.* (2020) advocated the adoption of a frugal organizational culture that protects resources and offers a path towards resilience. However, literature on entrepreneurial resilience has shown that there is another side to crises and disasters. To understand the process of innovation during the Covid-19 pandemic, we have drawn from the entrepreneurial resilience literature which views resilience as "a dynamic process of positive transformation and learning from adverse disruptions that enables firms and individuals to transform core capacity into action" (Korber and McNaughton 2018: 12).

This conceptualization of entrepreneurial resilience allows us to look both at new ventures born out of innovation during crises, as well as existing ventures that create new products, services, or processes in response to crises. The perspective of entrepreneurial resilience as a dynamic transformative process expands the idea of resilience beyond "reactive preparedness, persistence or the ability to cope" which are common in resilience literature in other fields (Korber and McNauhton 2018: 17). We therefore see entrepreneurial resilience as a great contributor to the resilience of communities and economies faced with a crisis (Ayala and Mazano 2014). In this view, the resilience of communities is seen as an outcome of entrepreneurship, and a resource firms can utilize in a crisis to adapt quickly and devise innovative ways to absorb shocks (Williams and Vorley 2014, 2015). In addition, entrepreneurial resilience can also have positive outcomes for individual entrepreneurs. For example, Williams and Shepherd (2016) in their research on entrepreneurs after the Black Saturday bush fire in Victoria, Australia, found that helping others using venture creation can lead to positive outcomes for the entrepreneurs concerned. Therefore, venture creation can be transformative for entrepreneurs too, offering autonomy, a pathway for change, and opportunities for success in a threatening

environment (Williams and Shepherd 2016). Venture creation during a crisis might also help entrepreneurs cope with crisis and function better (Williams and Shepherd 2016) by re-interpreting their adversity and identity to emphasize positive rather than negative characteristics (Powell and Baker 2014).

Therefore, it is not surprising that even during the Covid-19 crisis, new ventures and innovations were created to help others alleviate suffering. This is rooted in the idea that a crisis event can trigger prosocial motivation (Grant and Sonnentag 2010) as well as proactive behaviour where individuals act in good time to change a situation (Lebel 2017), so that helping others acts as a buffer against negative emotions (Grant and Sonnentag 2010). That is interesting because the literature has often linked positive traits and emotions such as hope, optimism, persistence, and flexibility to entrepreneurial resilience (De Vries and Shields 2006; Hmielski *et al.* 2015; Spivak *et al.* 2014). However, crises and disasters seldom evoke such positive emotions, instead generally increasing uncertainty for entrepreneurs and entrepreneurial actors thus adversely affecting their ability to innovate (Brown and Rocha 2020). Furthermore, the global lockdowns and physical distancing measures in response to the pandemic increased individual anxiety, stress, loneliness, depression, domestic violence, and sensitivity to social threats (Debata, Patnaik and Mishra 2020; Donthu and Gustafsson 2020; Campbell 2020).

As previously stated, the individuals we interviewed cited fear as a motivation to be involved in innovation during the pandemic. Indeed, fear aroused by uncertainty and lack of control over the situation (cf. Ellsworth and Schorer 2003; Lebel 2017) was a common emotion during the Covid-19 crisis. Various entrepreneurship scholars have previously studied the relationship between fear and entrepreneurship (e.g., Foo 2011; Grichnik *et al.* 2010). Cacciotti and Hayton (2015) argued that fear is an intriguing aspect of entrepreneurship because it can motivate both engagement and withdrawal from tasks, tending then to degrade opportunity evaluation and exploitation (Grichnik *et al.* 2010; Welpe *et al.* 2012). However, self-control can help individuals overcome fear and proceed with entrepreneurial action (Van Gelderen *et al.* 2015). Other studies address the fear of failure and its impact on entrepreneurship (Arenius and Minniti 2005; Weber and Milliman 1997). Some management literature too addresses the subject of emotion in organizations, emphasizing its functional role (Ashkanasy, Humphrey and Huy 2017; Elfenbein 2007).

Other studies specifically address fear and illustrate how individuals, especially employees, overcome fear and other negative emotions to embrace proactive and prosocial behaviour. For example, Lebel (2017) argues that both anger and fear can act as signals that things need to change, and can therefore inspire proactive behaviour in individuals. Although fear is normally associated with avoidant behaviour and inactivity (Frijda *et al.* 1989; Shaver *et al.* 1987), it can also activate a "can-do" attitude that stimulates effort and careful planning when there is sufficient emotional regulation and support from others (Lebel 2017). Fear due to external threats might trigger individual action also to protect the collective (Vuori and Huy 2016).

Nevertheless, fear caused by pandemic diseases or other disasters is an interesting and underexplored phenomenon; we shall therefore demonstrate, based on this framework, how popular "medical" innovations in Kenya and Tanzania during the Covid-19 pandemic came into existence and examine the innovations of the entrepreneurs involved in the two cases.

The East African Context

We selected two East African countries, Kenya and Tanzania to contextualize this discussion. Although the two neighbouring countries share approximately 758 kilometres of border (Tairo 2022) and exhibit many cultural similarities, they adopted quite different responses to the pandemic. The two countries neatly represent the intra-regional differences, with Tanzania – along with Burundi and the Democratic Republic of Congo – being relatively lax about the pandemic in comparison to Kenya which along with Uganda, Rwanda, and South Sudan (Eyakuze 2022) adopted strict anti-Covid-19 public health measures from the start, instituting national lockdowns and curfew systems (Crisis24 2020). Kenya instituted extensive testing and vaccination policy, too (McDade *et al.* 2020). Tanzania in fact changed its approach more than once. For example, at the beginning of the pandemic, the country announced school closures but did not introduce lockdowns. Many WHO countermeasures such as physical distancing and handwashing were introduced (WHO 2020) but Tanzania relied on religious faith and traditional medicine in the fight against Covid-19 (Mpota 2020). After the first wave, however, Tanzania declared God's victory against Covid-19 and began to reject many WHO recommendations including the reporting of Covid-19 statistics (Mutahi 2020). At that time, various leaders demonstrated traditional healing methods such as steam

inhalation and the use of herbal tonics (Anonymous 2021). Subsequently, many popular innovations at the time infused the traditional aspect. But then, in 2021 after the sudden death of Tanzania's president, a new administration introduced vaccination and adhered to WHO recommended measures against the pandemic (France24 2021).

Case Examples

To reflect these dynamics and for their popularity in their respective countries, we selected two "medical" innovations, Tiba-Vent from Kenya, and the Cubic Bupiji Sauna from Tanzania. The first author is from Tanzania and had some prior knowledge of popular innovations in Tanzania during the pandemic. We also conducted a simple Google search for popular inventions in East Africa, from which the top result was Tiba-Vent, whose fifteen inventors had won UN Persons of the Year awards in 2020, and a Head of State Commendation. We collected archival data in the form of news reports and then interviewed key individuals involved in the process, first talking to Fidel Makatia and Daniel Kabugi from Kenya, the lead- and co-inventors of Tiba-Vent. The interviews with those informants were carried out in English by the first author via Microsoft Teams. With the interviewees' consent, the interviews were recorded and used for analysis. We also included a media interview with Cynthia Thuo, another Tiba-Vent co-inventor who led the signal processing team. From Tanzania, we interviewed Saidi Zelafi who works at Star Natural Products which created the Cubic Bupiji Sauna for steam inhalation treatments. That interview was conducted face to face and in Swahili, and while not recorded the interviewee allowed the interviewer to take notes during the interview, which were then translated into English. Each of those interviews lasted approximately an hour. Our efforts to interview the owner and lead inventor of the Cubic Bupiji Sauna were unsuccessful, so we were forced to rely wholly on his prior media interviews. Table 1 below shows our data usage.

Case Analysis

We used an abductive, comparative case study approach (Caza *et al.* 2018; Gray 1994) to explore how entrepreneurs devised innovative solutions in the circumstances of the Covid-19 pandemic in East Africa. Our exploration was guided by the Covid-19 phenomenon, and we simply sought to inquire if African entrepreneurs acted innovatively during the pandemic, what new things they came up with and how they came up with them.

Table 1: Data usage

s/no	Data source	Type of data	Mode
1	Interview with Fidel Makatia (Tiba-Vent)	Primary	Online via teams
2	Interview with Daniel Kabugi (Tiba-Vent)	Primary	Online via teams
3	Cynthia Thuo, Women in Tech interview (Tiba-Vent)	Archival	Technovation show, Youtube
4	Interview with Saidi Zelafi (Cubic Bupiji Sauna)	Primary	Face to face
5	News clip: Mashine ya Kujifukiza Yazinduliwa Nchini Tanzania Hospitali ya Muhimbili (Cubic Bupiji Sauna)	Archival	News Interview, Habari24
6	News clip: Hospitali ya taifa ya Muhimbili yazindua mashine ya kujifukiza (Cubic Bupiji Sauna). https://www.youtube.com/watch?v=cgjf1DVupyAandab_channel=MLIMANITVUDSM	Archival	News Interview, Mlimani TV UDSM

The explorative nature of this study required constant iteration between the phenomenon of innovation during the pandemic, our data, and existing entrepreneurship literature. Abductive reasoning uses a combination of existing knowledge and imagination to explore new phenomena and generate new knowledge (Mantere and Ketokivi 2013). Our analysis was query-driven, with constant iteration between literature and data throughout the data collection process as is common in abductive reasoning (Locke *et al.* 2008). First, we looked at each case study individually, posing questions about the innovation process. We mapped the process using diagrams and coded the triggers for innovation, the innovation process, and the outcome for each. We had ample information about triggers from Tiba-vent since we had interviewed key people in the process. For the Cubic Bupiji Sauna, we used public information and the interview with Zelafi. Second, we compared the two cases, looking at similarities and differences in the processes. We utilized intra-case comparison (Weidner and Mantere 2019) to explain consistency and variations in the accounts. For example, in the case of Tiba-Vent, we noticed that both interviewees felt that the idea of doing something about the Covid-19 situation had originated in their thinking and that they had brought their thoughts to the group for discussion. We, therefore, concluded that the individual and collective processing of the pandemic were intertwined. We also conducted inter-case comparisons

(Eisenhardt 1989) where we included a large amount of contextual information about the pandemic in individual countries. For example, we included Tanzania's and Kenya's stances on Covid-19 to understand the emerging differences we noted in innovation processes and outcomes. We wrote each other WhatsApp messages to record our emerging insights and discuss the preliminary ideas of the phenomenon from the interviews and literature. This method was quite similar to memos utilized in the abductive approach, such as in the study of Caza, Moss and Vough (2018). We then used a grounded theory approach to organize our data into first-order codes, second-order themes, and aggregate dimensions (Glaser and Strauss 1967). Figure 1 below (and the Appendix) shows a sample of our data structure.

CASE I: Tiba-Vent (Kenya)

In March 2020 the government of Kenya instituted a nationwide lockdown in response to its first cases of Covid-19. Schools and universities closed, and students were required to return home. During that time fifteen students at Kenyatta University, and Jomo Kenyatta University of Agriculture and Technology got together through a WhatsApp group and developed a low-cost mechanical ventilator. Their multidisciplinary invention took into account the needs of the Kenyan healthcare system, the availability of electricity, transport, and the needs of healthcare workers during the pandemic. As a result, the ventilator included a backup battery able to supply sufficient power for up to five hours, a mechanical design that considered vibration caused by the poor surfaces of Kenyan roads, as well as remote access so that there was no need for health workers or the machine's operators to be present in the room with the patient. Moreover, more than one ventilator at a time could be controlled from a tablet computer. Supply chain disruptions required the construction of the ventilator to be feasible using locally available materials, which meant too that it was cheaper than any imported ventilator. Tiba-vent is currently undergoing clinical trials in Kenya. (Summary from interviews with Fidel Makatia and Daniel Kabugi, innovators of Tiba-Vent)

In analysing the interview and secondary data, we noted seven key themes in the process of innovation: peer support, collective innovation, leadership, institutional support, institutional hurdles, targeted innovation, and individual transformation. Those themes help to explain the innovation process and outcome for Tiba-Vent.

Figure 1: Data structure diagram

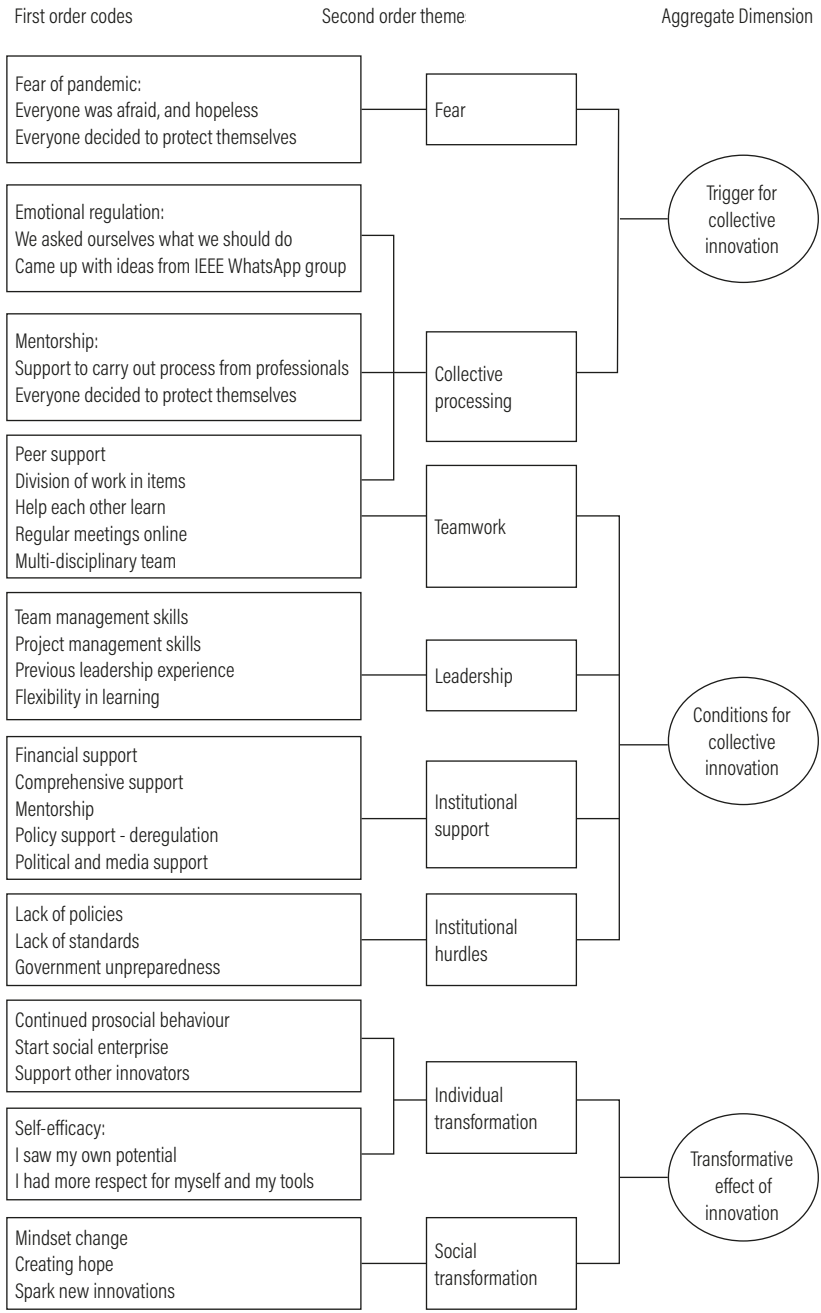
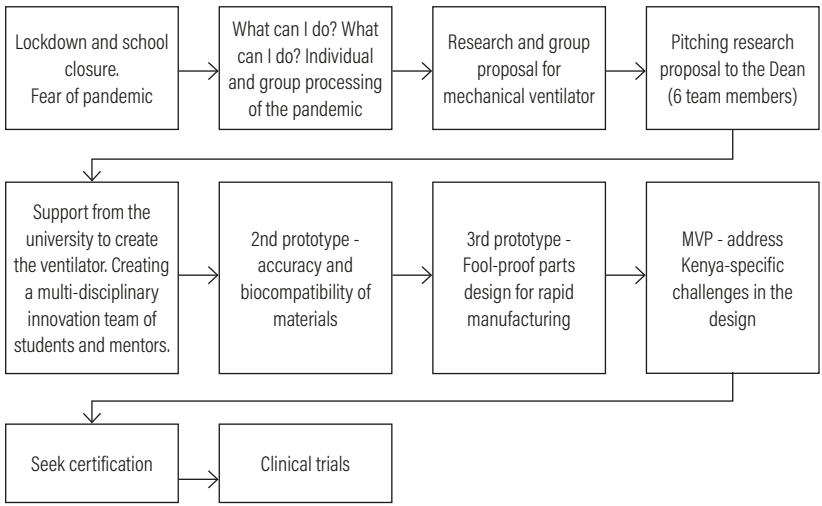


Figure 2: Tiba-Vent innovation process (from interviews with Kabugi and Makatia)



- Collective Processing and Peer Support

The innovation of Tiba-Vent during the Covid-19 crisis was inspired by fear of the effects of the pandemic on the Kenyan community, as stated in 2022 by Daniel Kabugi, one of the fifteen innovators behind Tiba-Vent:

> "At the end of January 2020, everyone was sent home from university because of Covid-19. The Kenyan government introduced curfews, and everybody was told to go home as a way to manage Covid-19. Everybody was scared. I remember we were also scared because the news that we were getting from the media was that Covid-19 was very difficult to manage and that it's a tricky disease... And I remember our vice-chancellor, prof. Wainaina, when he announced that we need to go home, he reminded us like three times – take care of yourselves, take care of your parents, protect yourselves, wear your masks, social distance, sanitize, visit any healthcare place that is close to you if you have certain symptoms, and he repeated so many times, so we were all scared at first as we went home."

Cynthia Thuo echoed Kabugi's statement that fear – and hopelessness – pushed them to innovate: "When Covid-19 struck, everyone was left

hopeless, people started panicking, and people were just dumbfounded and others were desperate, people were dying everywhere." In 2022 Fidel Makatia, the lead inventor of Tiba-Vent expressed similar sentiments about the pandemic news:

> "When Covid-19 came to Kenya, I don't know if that's how it was received in Europe, but in Kenya, it was like a death sentence once you get it. And everyone was panicking. It's called the novel coronavirus, so no one knew how it was going to go. The media was on it so much. One of the things that alarmed me was the high death rate in Italy. I used to see very alarming and shocking images from abroad... And the media was constantly saying that ventilators aid in the treatment and Kenya only had five hundred ventilators recorded, and out of those, we weren't even sure how many were working. The countries where Kenya used to get their ventilators banned exports of ventilators, including India. So, there was nowhere Kenya could get their ventilators. And the companies from China that were willing to sell ventilators had too many orders, and the news said it would take six months to get your order."

The individual students behind Tiba-Vent went through different individual and collective processes to make sense of the pandemic. For Makatia, he felt immense responsibility to use his college education to help his community, as he stated:

> "I am the first person in my family to do engineering and to go to campus [university] for that matter, and so when I went home [due to the lockdown], I said to myself, I can't stay here with my parents because they sent me to campus to bring solutions... so I knew there was something I could do for Covid-19. So, I went online to check. I realized there are things I can do with Covid-19, either create a vaccine or create a cure, then I discovered something called a mechanical ventilator, I did not know about them... So, I said, I can't create a cure or a vaccine because I don't do pharmacy or medicine, but this thing called a ventilator looks like a machine, and I have been working with machines before. I started digging online about ventilators. At that time, companies weren't disclosing information about how they are made, but I realized it is a machine that can be made. So, I reached out to a few friends, we started as four people, one lady, and three men. We did a research proposal and I sent it to my Dean and Director of Innovation at KU [Kenyatta University] [to make a mechanical ventilator]."

Kabugi went through a slightly different process of contemplation with a classmate. He looked up to his mentors as an example of what to do in the crisis, stating:

> "We were speaking with one of my classmates called Christine Uwere, and we were talking and asking ourselves – In such a crisis, what are our mentors doing, what is their input? Because our mentors are biomedical engineers, they are quite ahead of us, and they have quite a lot of experience in biomedical engineering. And so, we were asking [how they were responding to the crisis]. We wanted to understand the role of biomedical engineering in [the] crisis."

Cynthia, like Kabugi and Makatia, also found solace in the IEEE WhatsApp group, as she intimated: "We had the IEEE club, or rather organization, and we were very agile, using the team we came up and brainstormed about what we can do." Their IEEE WhatsApp group which was crucial for the ideation process served too as a space for emotional regulation and peer support:

> "During that time, we were able to see there are so many things that I could do. With that, I moved to the IEEE WhatsApp group, and the idea was introduced into the group, and my Chair took it and that's where we started to organize the team, and we told ourselves that we can make a device that will be able to support healthcare and help manage Covid-19."

The team members collaborated online to create design concepts.

- Collective Innovation

The process of designing Tiba-Vent was both collective and multi-disciplinary. Makatia cites urgency as the key driver of this collective innovation:

> "I saw that time is of the essence in innovating this machine, so one hand could not suffice. And there was also an issue of diversity because one man can only have his perspective, but there are people with other perspectives. So, when you bring a team together, you have the most optimal idea. What you think is right, someone may analyse it and find fault with it. That's why, the team had guys from pharmacy and nursing, people who actually use the machines on patients. The doctors understand the human body, but engineers understand machines, the physics."

The collective processes allowed for the division of labour and peer-support while also minimizing the risk of failure, as stated by both Makatia and Kabugi:

> "Every team brought in their parts, and we would meet every evening and ask each other if we had any challenges or learned anything new and slowly made progress in all aspects of design." (Kabugi 2022)

> "I remember one day we failed to create one logic, one of the modes in the ventilator, so we called someone from the medical team, and all of us (engineers) sat down with books and pens and he explained to us how humans breathe, and we visualized how to mimic that with a machine. So, that's how diversity helps. Calling on those fifteen guys was the best idea." (Makatia 2022)

Working with their group of peers was crucial to the success of their innovation. Social support from constant online discussions not only enhanced their collective emotional regulation but also encouraged their willingness to act on the problem and find suitable solutions. Kabugi explains:

> "So, we had to divide the group [...] into several teams – electrical, biomedical, research, design. From there, we were able to start smaller WhatsApp groups. I was in the electrical group. We went first researching how a ventilator is made, what are the components, what are parameters, what are the standards, how does it work, the current challenges with ventilators in the field... after we got all that information, we could do regular meetings online. From that, we sent a lot of research materials and agreed as a team on the direction we should go. So, after we had a good picture, that's when we decided to do the design. The mechanical team was last to start design work because we started with electrical."

At first, the inventors of Tiba-Vent had not thought of commercializing their innovation. The purpose was purely to benefit the collective. As Makatia stated in 2022, the choice to create a ventilator was also due to the demand in the Kenyan healthcare system: "The main idea was to increase the number of ventilators in the country, because, at the time, there were around five hundred ventilators for fifty million Kenyans." Kabugi also expressed similar sentiments, stating:

> "Our main aim was to do designs, create prototypes, get them to our mentors so they approve the designs, and share the information with other students from other universities or manufacturers so that they can produce them. We were trying to volunteer our skills to help the healthcare system."

To innovate during the Covid-19 crisis, the team had to overcome the fear of failure throughout the process. The time constraints as well as media, political, and public pressure further exacerbated the team's fear, especially when things did actually fail in the process, as Makatia revealed:

> "There was fear of failure before and during, especially since we were making something from theory, fear of failure was always with us. I remember the first prototype, there is something called a blender in the ventilator, and we had 3D printed it, and as soon as we put it in the ventilator and started pumping air, the thing just exploded. And we just went back to zero because everything had exploded. And we couldn't tell the university that it had exploded, and so, we had to make sure it was working by the time they came to check in two days. Just before we had been scheduled for a test for the KEBS certification, there was a power surge, and we hadn't put any protection, so power surged and the entire motherboard exploded again, and the machine went silent. And two days after that, the cabinet secretary for industrialization, Hon. Betty Maina was supposed to come and check the ventilator before she reported to the president, and the thing just exploded."

Nevertheless, the fear of failure did not paralyze the team, and Makatia revealed three key factors that helped the team overcome the fear and continue even in the face of possible failure: experience, peer and institutional support as well as faith, as seen below:

> "There was something greater driving us. 1. The fact that we have made machines before, and we have seen them failing and failing before they work, although this was a new machine to us, but machines weren't new. 2. Motivation from the university and team of experts, and team members. 3. Motivation, your belief system. For example, I am a Christian, and that belief system is that it can be done, so I was holding on to faith. Something might not be visible, but you just have to believe. For example, our first machine that we ran in front of the media, it was the first time we were actually running it, it had never run before that, we hadn't had time to test it. We had to believe it would

> work. But fear was there, but we didn't let the fear get the best of us because we need to do something."

- Leadership

The success of the Tiba-Vent innovation was a testament to the strong leadership of team leader Makatia, who credited his previous leadership roles at IEEE and Google campus for the people- and project-management skills he needed to lead the innovation team and which he admitted were more important than technical skills. Leading a diverse team of highly talented individuals required a cool head and the ability to forge consensus.

> "My team was diverse in gender, so, I had to talk to each individual differently. I needed to learn how to manage each team member individually because each of them had a different thing that got to them if you wanted results. Each member of my team was bright, and everyone thought without them there was no ventilator, which was right, but for some of them, it got into their heads, and they started treating others badly, and so, I had to learn how to manage these talents and make sure deadlines are met and keep the morale up."

Leading a team that innovates in a crisis, pressed for time, also required a lot of flexibility from Makatia. As he stated:

> "As a team leader, I had to be flexible and willing to learn, not be stuck in what I know. Being willing to listen and learn from others. Some of these skills I had learned as the head of IEEE on my campus, and the head of Google on my campus, so some skills I already had, but some I had to learn. Patience, for example, I had to learn patience with yourself, others, and the country."

However, its overall direction wasn't the only important aspect of the Tiba-Vent team, for its sub-division allowed others to lead smaller teams. For example, Cynthia Thuo led the signal processing team. Like Makatia, Thuo too had previous leadership positions at IEEE.

- Institutional Support

Still, to make the first mechanical ventilator in Kenya a great deal of institutional support was required, initially from the Dean and Director of Innovation at Kenyatta University, for the idea itself. Thuo cites the team's lack of resources as the main driver for their decision to seek support as stated below:

> "We saw that it would be very hard to make it, we didn't have capital, and so we approached the school. They housed us and helped us actualize what we had conceptualized."

To that, Makatia added:

> "The university looked [at our proposal] and saw that it was something very viable. So, they called me to come to the university and talk to them. So, I went and pitched it. They asked how many people we are, and for that time we were around six. The university said that we should expand the team so that we can include guys from medicine, pharmacy, and nursing. So, we expanded to around fifteen. They decided to finance this first innovation."

The support from the university was comprehensive throughout the process of innovation. According to the interviews, the university gave the student innovators all the resources they required including food and accommodation. The students also had mentors, who were involved from the very earliest phase of the project, which amounted to an exceptional level of support, as both interviewees stated:

> "The university came with a committee of fifteen professors from each school – three from engineering, two from medicine, one from pharmacy, each school was represented including sports science, just to make sure the team members were physically fit. And that really helped us."

> "We were supported with a good structure to carry out the process. At first, we were doing it at our own student level, and then we were given a team of mentors by the VC, in electrical, mechanical, biomedical, medicine, nurses, anaesthesiologists, and surgeons, to support us. That's when we had a good structure, and we were down to reviewing our designs according to criticisms from mentors, and we improved them until we were able to create a working prototype."

According to Kabugi, the availability of a multi-disciplinary team of mentors and students allowed practitioners in the field to design from experience rather than from theory alone, and in addition to offering financial and mentoring support during the design process, in the later stages, the university helped the team register their IP and establish contact with regulatory bodies.

While the institutional support from the university was excellent, support from the media and politicians had some mixed repercussions for the Tiba-Vent team. According to Makatia, the media coverage helped them secure funding from The Kenya National Innovation Agency. The team also obtained a fund of 21 million Ksh [~180,000 USD] from Grand Challenges Africa, while companies across the world expressed interest in the team and offered support. However, the involvement of the media and politicians during the design process derailed the team's motivation, shifting their initial prosocial and collective attitude to their innovation. According to Makatia when interviewed in 2022, the media's reporting influenced the investors too, by changing expectations of the project to meet the media's demands. That too put more pressure on the team, causing rifts among its members, as illustrated below:

> "After we did the first prototype, which we did within eight days and it really shook the entire country because no one knew it could be done within such a short time, and it was working, only it wasn't very accurate. So, after we did that, the news coverage stepped in and some of the team members had not been exposed to such kind of publicity before, of news, popularity, and fame, and some team members started being selfish, and they could go to media and claim that they are the only inventors. One guy claimed he was the only inventor and there was no team. And people were seeing it was time to be billionaires or millionaires. So, I had to call my team members and sit down with them to make them see the big picture that it's not about fame and that the ventilator wasn't working accurately, and that it wasn't the end product. If you see the first prototype, it was very ugly. If someone takes credit for that, it doesn't make sense. That made some team members angry. Because some politicians started getting involved and tried to promote team members from their own constituencies as if they are the only team members and others were feeling left out and not getting credit and wanted to leave the team. I had to talk to them, and the meeting lasted all night, and I settled on how to work."

Therefore, although media involvement helped the project raise the finance so badly needed for implementation, it also added unnecessary pressure to the team. However, strong leadership from Makatia and support from the university helped them overcome the interference and complete the process.

- Institutional Hurdles

However, not everyone who heard the idea of Tiba-Vent was keen to lend support to the team despite the need for ventilators in Kenya. Makatia explained during the 2022 interview with him:

> "Not everyone I pitched to, believed that such a thing could be made in Kenya, in Africa, because it's a very delicate machine, a class 3 medical machine. Before I went to the university, I spoke to some companies to finance it, but they said no."

Ironically, because of the novelty of such an innovative approach in the Kenyan context, the students struggled to jump the institutional hurdles from their regulatory authorities in Kenya, who were ill-prepared to certify medical devices created there. As Makatia stated:

> "We went through a lot of challenges when we were going through the required bodies, like the Kenya Bureau of Standards (KEBS) and Pharmacy and Poisons Board (PPB). Kenya didn't have a standard for manufacturing a ventilator. There had never been a locally manufactured medical device, so they didn't have any standards to work with... I took so long in PPB, one and a half years because they did not have any standards for that, and they were scared that they could kill someone and will get sued."

Moreover, the lack of technical standards covering domestically-made innovations was not unique to Kenya, as Kabugi found out:

> "Some of these regulatory bodies have never tested a ventilator. Most of the existing rules are for testing imported ventilators based on US FDA, and also, CE from Europe. The country has also regulations for fabricating and refurbishing equipment, but those weren't applying to our equipment, which was made 100% locally made and assembled. We tried to get some documentation from other African countries as well, but they all had the same standards for importation. It was the first mechanical ventilator to be developed and manufactured in Africa."

The slow pace of the certification process was disheartening to the innovators, especially since they wanted their ventilator to help save lives as soon as possible. However, the response during a crisis cannot be the same for everyone. Of course, the disruptions of the lockdown and curfew systems

slowed the operations of governments and businesses worldwide (OECD 2020a; OECD 2020b) but some of the hurdles could have been at least lowered if African government regulators had had policies or protocols in place that could have prepared them for disaster and emergencies. Makatia expressed it like this:

> "Most of these regulators, to certify us, they had to meet as a board, and most were in their rural homes, and most of them are old, so they are scared of their vulnerability to the disease. What made us wait so long was PPB, because they were saying that some of their board members were abroad and locked down. And Zoom and online meetings were really new, especially for government bodies... We expected them to hurry. Because of bureaucracy and laws, we had to wait. There were days we used to be recalled back to school to sign some forms. We had to design our own protocol for sanitizing the ventilator. It has been a lot of headaches."

The regulators' lack of preparedness placed all the risk and responsibility on the designers even though their efforts were in support of the Kenyan healthcare system. In addition, the risky nature of the innovation prompted certain regulators to take extra precautions, as to hurry or suspend some of the safety requirements for a delicate machine such as a ventilator could come at a high cost to patients.

However, despite their caution, there was also a willingness among the regulators to engage in conversation and create a solution. The university also continued to support this engagement that helped the team advance from certification to clinical trials, as reported by Makatia:

> "We had to sit down with them, go through the theory, go through ISO and FDA standards and create standards before they could certify our machine. That took long, we had to have them in the process, and we had to explain the process."

Although it took them longer than anticipated, the Tiba-Vent team was able to secure all the necessary certifications and by January 2022, they began clinical trials for their ventilator.

- Targeted Innovation

"Africa has unique challenges, so we can't transfer technology directly, the best thing we can do is to create tailored solutions, so we can have more impact," said Makatia in his interview. The Tiba-Vent inventors talked about the need to design a solution in response to a crisis as something that allowed their ventilator to be different from existing ventilators already in the country. Furthermore, the Tiba-Vent design catered to the specific Kenyan context, and by taking into consideration the various environmental and practical challenges of using ventilators in Kenyan hospitals gave their design its unique features.

> "Existing machines were often not designed with Kenya in mind. In our hospitals, only one or two ICU nurses were allowed to operate existing ventilators. I remember once we had a machine that was only in Chinese, and we had to hire a translator. English and Swahili language selection –brings pride to our invention. We have challenges with power availability and stability, so we created a power backup system that can go for five hours in case it goes to a remote facility. We were able to access and operate our ventilators remotely because we designed them with Covid in mind. In terms of security, we made a secure system, and make sure it won't be breached. We also [considered] the standard of building our hospitals in Kenya, size of vibrations, so we added mechanical integrity, durability measures, and disinfection protocols [to fit] what's available in our hospitals, the level of knowledge and user training, and what is common in the Kenyan environment."

The team used Internet of Things technology to make the famous remote ventilation capabilities of Tiba-Vent. Makatia believes it was the remote capabilities and compact nature of their design that made it attractive to engineers in other countries who approached the team to ask about their invention and even sought their help for projects of their own. Moreover, the fact of its being an example of local innovation that sought to use local capabilities meant that Tiba-Vent had a tremendous impact on the local economy. For example, Tiba-Vent engaged the informal sector (Jua Kali sector) in the fabrication of frames and bodywork.

However, for truly local innovation, local support is essential, especially in contexts where the mindset about who can innovate certain things hasn't shifted, and novel ideas and approaches face challenges for acceptance. In the case of Tiba-Vent, despite the accolades they won and support from

top-level government and the university, the team still faced scepticism about their innovation. For example, Makatia told me that the team once overheard someone saying: "Those students from KU, they think they are making ventilators, they will kill people."

- Individual and Societal Transformation

We also noted that taking part in the Tiba-Vent project had a transformative effect on Thuo, Makatia, Kabugi, as well as other team members. Thuo said that taking part in Tiba-Vent enabled her to see her potential. After working on the ventilator, she became involved in other innovations, including Apollo, an intelligent barrier system that supports compliance with Covid-19 protocol in buildings. Makatia too has been involved in other projects, and together with Thuo and a few other colleagues from the Tiba-Vent team co-founded AFEC, an initiative designed to use technology to solve societal problems. Kabugi also maintained a prosocial innovation mindset. As he stated: "We started an initiative with a few friends where we are going to primary schools to teach them robotics and electronics, we call it Young Savvy, to inspire, and ignite the engineering spark in young people."

For Makatia, the Tiba-Vent invention was part of a bigger picture:

> "Our value is local innovation, local manufacturing, Kenya to the World – for making one machine we use 1.2 million, but imported ventilators cost 8 million, so ours would be cheaper. We also built local capacity, and KU will set up the first medical production facility in Africa. Start-ups can rise up, and we can grow the entire ecosystem, and that will grow Kenya as a country and Africa as a continent."

The Tiba-Vent team members, being pioneers, also inspired other innovators. They believe that their invention was critical to changing mindsets about what Kenyans, and Africans in general, could do. As Thuo stated: "There is potential in Kenyans, there is potential in youth, there is potential in people still in school." In addition, Makatia explained to me, they also helped create a mindset shift, that allowed others to invent local solutions such as ICU beds, locally made test swabs, face masks, and handwash stations. The innovators of Tiba-Vent see Covid as a transformational force for Africa, as cited by Fidel Makatia below:

> "Africa has been known as a consuming continent rather than a producing continent. Covid had a silver lining on it, in that, for the first time, Africa knew that they could help themselves [...] so it was time for us to use our resources for local innovation. We inspired others and created a revolution of local innovation, that even the government started talking about 'built in Kenya'. That's one of the things we are proud of."

CASE II: The Cubic Bupiji Sauna (Tanzania)

In response to the Covid-19 pandemic, a Tanzania entrepreneur, George Buchafwe of Star Natural Products developed two products. A Bupiji herbal tonic for steam inhalation or oral application that helps prevent as well as alleviate symptoms such as coughing, difficulty breathing, and headaches; and the Cubic Bupiji Sauna to make it easier to administer the steam inhalation treatment (Lyatuu 2021). The Cubic Bupiji Sauna was installed in various hospitals and public places including the Muhimbili National Hospital (SIDO 2021). People paid a small fee of 5,000 Tanzanian shillings [~2 USD] to use the sauna and take the tonic. Before the sauna was thought of, many people used traditional steam inhalation techniques at home using pots and bedsheets to create the same effect. The fabrication of the machine was top-down, with Buchafwe giving the design concept to his fabrication team who then executed the design at his workshop in the SIDO industrial area (Zelafi 2022). The sauna was put into use soon after it was created, although its popularity has decreased over the past year, since the introduction of vaccines in Tanzania.

- Top-Down Innovation

It was fear of the Covid-19 pandemic that sparked the idea for the sauna, too, as Zelafi stated in the interview:

> "After Covid-19 hit, there were a lot of new innovations. It [Covid-19] came too fast and struck fear into the hearts of many. Everyone decided to protect themselves. It's completely different from malaria, which we found when we were born."

However, differently from Tiba-Vent, the cubical sauna was created in a top-down fashion. According to Said Zelafi, the inventor of the sauna wanted to help more people use steam inhalation during the pandemic. Zelafi said: "He brought the design concept to the workshop, and we [the

team] implemented the design and fabricated the sauna." The inventor's company has a history of fabricating soap-making machines at the Small Industries Development Organisation (Thabit 2017).

According to Zelafi, it took a month in the workshop to complete the fabrication of the machine, and as Zelafi told us, the workers themselves at Star Natural Product were the first to use the machine:

> "Before going to market, we had to trust the medicine and the machine. We used the machine first, before taking it anywhere. The machine stayed for about a week before we took it for public use, we were testing it on ourselves to see if there were any adverse effects."

The innovation also considered the trend in Tanzania at the time, rather than global trends. Buchafwe capitalized on the fact that many Tanzanians use traditional herbs for steam inhalation, so it made sense to introduce a tonic made with essential oils as a better, more functional medicine, and the sauna, as a better, more functional method for steam inhalation.

- Repurposed Innovation

According to Buchafwe, Bupiji (the medicine used in the sauna) was not made specifically for Covid-19 treatment but was created after five years of research to find a traditional medicine that could be used for many problems Tanzanians face. As he stated in a news interview in 2021: "We have been researching to find a medicine to help curb transmittable and nontransmissible diseases. In our research, we have created Bupiji, together with the cubic bupiji sauna." Buchafwe saw an opportunity to use Bupiji for Covid-19 treatment, and later to make a sauna for more systematic steam inhalation treatment with the same Bupiji medicine he had created. A blend of natural essential oils, Bupiji has been used by many individuals during the pandemic for steam inhalation.

- Institutional Support

Despite Buchafwe's stating that the sauna was not just for Covid-19, all the same, many leaders rallied behind the sauna as an innovation in Covid-19 treatment. Indeed, the Muhimbili National Hospital, the top referral hospital in the country, installed a total of four saunas in its two locations. On the highly publicized launch of the saunas at the hospital, the director told the media: "Steam inhalation helps the treatment of Covid-19 and goes

hand in hand with the use of traditional medicine, there are testimonies that it works" (Mseru 2021).

It is not surprising that there was a strong response from political leaders to support traditional treatments. The minister of health at the time, Dorothy Gwajima, visited Star Natural Products and used the sauna in a televised event. In a media interview, she stated in 2021:

> "There is a big uptick in making and using traditional treatments. Many citizens use traditional remedies. We aren't saying people who use traditional remedies shouldn't go to hospitals and receive formal care, we advocate for combined therapy where both are used hand in hand... We are in the era of making sure traditional medicine use rises in our country like in other countries – China, Korea, India, and even Ghana."

During the launch of the sauna, Buchafwe thanked the Ministry of Health and the Council for Traditional and Alternative Medicine for their support with research for Bupiji and its creation. Although the extent of that support wasn't made public, it is clear that the institutions Buchafwe mentioned played a key role in building public faith in the innovation. When the health director, healthcare workers, and the Minister for Health all publicly used the sauna, they sent a clear signal that it was safe to do so; accordingly, both Bupiji and the Cubic Bupiji Sauna were certified by the relevant authorities.

Like Tiba-Vent, the Cubic Bupiji Sauna also received plenty of attention from local media. International media tended to ridicule such trends in the country, stating that none of the traditional treatments was scientifically proven effective (Kombe 2020), nevertheless, thousands of people used the sauna and the accompanying herbal treatment, providing clear monetization to the company.

- Individual and Societal Transformation

The Cubic Bupiji Sauna was one of many innovations sparked by Covid-19 in Tanzanian society. According to Zelafi: "Because of fear, everyone had to become innovative, everyone had to adapt to the changes – like wearing masks. People have become more innovative. These days, everyone thinks of bigger things to invent, and things to improve day-by-day."

For Buchafwe, the value of the Bupiji and the sauna was to showcase Tanzanians' ability to innovate. As he stated in a media interview: "This

is to show that Tanzanians have the ability to do research, and we have researched how we can solve problems that Tanzanians face."

Interestingly, as quickly as individuals and institutions adopted the sauna, they dropped it when the narrative about Covid-19 in Tanzania changed. In 2021, the president of Tanzania, who had denied the existence of later phases of Covid-19 and refused to start a vaccination program, died suddenly. The new administration came with a different narrative about Covid-19, whereupon the very same leaders who had been vociferous proponents of traditional medicines now denounced them. Opponents of the sauna became more vocal, resulting in dwindling media attention and use of the sauna.

Case Comparison

The two cases illustrated above show a number of similarities and differences (see Table 2). Both innovations illustrate entrepreneurial responses to the threat of Covid-19 and resilience to the ongoing collective adversity. The innovators, instead of ignoring or abandoning deeply discouraging circumstances, went through an emotional regulation process that transformed their fear into prosocial action. The two innovations emphasized localization, which entails using local knowledge and resources to solve problems. In both cases, the solutions were very context-specific despite the global nature of the pandemic and dependent on processes of innovation that required strong institutional support. While the support for each innovation was different, with Tiba-Vent receiving resource support and mentoring, and Cubic Bupiji Sauna receiving promotion from key institutions, it is undeniable that the success of each innovation relied on official support. Furthermore, both innovations led to individual and societal transformations.

Table 2: Case comparison

Tiba-Vent	Cubic Bupiji Sauna
Differences	
Collective innovation	Top-down innovation
Targeted innovation	Repurposed innovation
Long process until adoption	Short process until adoption
Non-supportive policies	Supportive policies
Similarities	
1. Local innovation, local manufacturing	
2. Strong institutional support	
3. Individual and societal transformation	

However, there were also key differences between the two cases. Tiba-Vent was a result of collective and targeted innovation which initially lacked political support which led to a lengthened adoption process. Meanwhile, the Cubic Bupiji Sauna was a top-down, repurposed innovation that received strong political support – through partial deregulation of some licensing processes – and promotion of traditional remedies, which in turn led to a shortened adoption process.

Discussion

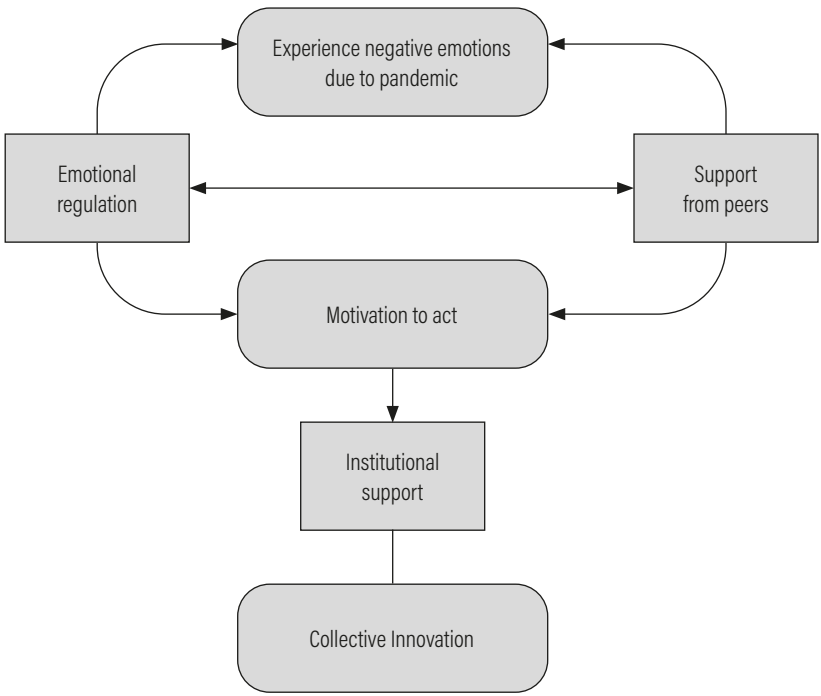
In this chapter, we sought to explore why and how entrepreneurs innovated during the Covid-19 pandemic within the East African context. Using the examples of Tiba-Vent from Kenya, and Cubic Bupiji Sauna from Tanzania, we discovered several things.

First, we found that fear was a strong motivator for innovation during the pandemic. Entrepreneurs responded both to their private fear and the fear of their communities by bringing out solutions to the problem. That was inherently intriguing because fear is often linked to a "flight" rather than a "fight" response (Cacciotti and Hayton 2015). However, as shown by Lebel (2017), with adequate social support and emotional regulation fear can motivate prosocial and proactive behaviour. Through these two cases, we can see that decisive social support can come from peers as well as from institutions. Peer support was paramount for emotional regulation for the Tiba-Vent inventors, which in turn pushed the students to action within their group. Institutional support allowed the inventors of both Tiba-Vent and the Cubic Bupiji Sauna to push their innovations forward. In the case of Tiba-Vent, support from the university and later from funding bodies, the media, and the government allowed them to acquire the resources they needed to design and make their ventilator. In the case of the Cubic Sauna, support from key authorities encouraged acceptance of their innovation and early adoption, and therefore monetization of their innovation. The social support that is important for innovation during a crisis such as the Covid-19 pandemic illustrates that community and entrepreneurial resilience are intertwined; that as much as respective communities may benefit from resilient firms and entrepreneurs, during crises businesses also need community resources to enable them to adapt and transform effectively (Beninger and Francis 2021).

Indeed, Revilla *et al.* (2017) argue that the reconstruction of resilience is a collective phenomenon. This is supported by an argument from

neuroscience that human sociality is paramount to survival when facing threats (Gilbert 2015). Social relationships not only help with emotional regulation, as we have seen in the case of Tiba-Vent but are equally crucial in prompting prosocial and proactive action. The community aspect of resilience has been found in other studies too, for example, Ungar *et al.* (2008) conceptualized resilience among adolescents across cultures to be a result of access to resources, supportive relationships, developing a desirable personal identity, experiencing a sense of cohesion, experiencing power as well as having a meaningful role in one's community. We see the same thing among the student innovators of Tiba-Vent, for their IEEE student group allowed them to process the pandemic situation collectively to make sense of it, which in turn sparked their joint effort to find a solution. That collective emotional regulation allowed for fear to be transformed into a positive trigger for innovation. Leadership too was important, for emotional regulation, in both the cases we looked at. Indeed, as Lebel (2017) predicted, the Tiba-Vent students initially looked to their leaders'

Figure 3: Collective innovation process during the Covid-19 pandemic



and mentors' reactions to the pandemic to decide how to respond to the pandemic, but it was the leaders of IEEE who rose to the occasion and gave the students the courage to act proactively against the threat of Covid-19. Figure 3 above illustrates how social support (peer and institutional), emotional regulation, and leadership worked together for collective innovation.

Second, we found that there are myriad ways innovations occur in a crisis, with the case of Tiba-Vent illustrating collective innovation while the case of Cubic Bupiji Sauna illustrates top-down innovation. While both innovations required strong leadership to become reality, the case of Tiba-Vent's collective innovation was interesting, especially the use of a multi-disciplinary approach. While multi-disciplinary innovation teams in themselves are far from new (Dosi *et al.* 2020; Vissers and Dankbaar 2002), the Tiba-Vent case illustrates that despite being inspired by fear, the innovation process was not haphazard, but intentional and planned, even amid the desperation and near-hysteria of the pandemic.

The invention of the Cubic Bupiji Sauna meanwhile is an example of a repurposing innovation to suit a crisis, while Tiba-Vent is an example of a targeted innovation. Indeed, as the literature shows, under constraints of time or resources, repurposing innovation can be utilized as one of the most effective means to respond promptly to the need for innovation (Andriani *et al.* 2017; Hanich and Rake 2021; Kucukkeles *et al.* 2019; Von Krogh *et al.* 2020). Due to the distinct nature of the biopharmaceutical industry, the re-utilization of already approved or tested drugs for other diseases can bring a huge advantage to existing market players, helping dramatically to reduce time-consuming clinical trials and administration processes (Hanich and Rake 2021; Pantziarka *et al.* 2018; Pushpakom *et al.* 2019). Therefore, as shown in the Tanzanian cubic sauna invention, Buchafwe innovated a novel solution by combining and transferring existing solutions for inhalation treatment, such as Bupiji and the sauna, to meet the new circumstances of Covid-19. This repurposing innovation enabled Buchafwe to react to the crisis quickly and with great urgency. It is a typical example of how repurposing innovation arises and illustrates its advantages.

By contrast, Tiba-Vent is an example of targeted innovation, suggesting that innovations during a crisis can also be both problem-specific and local. Targeted innovations during a crisis are different in the sense that all resources and knowledge are targeted at a specific problem, which is different from how innovation happens within the research and development departments of many companies. Small and medium-sized enterprises

(SMEs) and start-ups are therefore more likely to lead such speedy innovations because they are better suited to exploiting local knowledge and networks to create their own technological or business niche (Almedia and Kogut 1997) as clearly seen in the Kenyan Tiba-Vent case. The Tiba-Vent start-up team had a better understanding and knowledge of the local use of ventilators, as well as the specific challenges and opportunities of the Kenyan environment, such as infrastructure, frequent power cuts, and even the language used. By targeting these specific contextual problems, and the Covid-19 crisis, the localized solution brought up a new kind of mechanical ventilator that differed from those already on the market. The localization of innovation also allowed for a unique exploration of resources in the Kenyan context, for example, the use of the informal (jua kali) sector in the fabrication of parts. As we have seen, the Covid-19 pandemic exacerbated ideological shifts concerning self-reliance, nationalistic sentiments, and trade wars in critical resources necessary for the fight against Covid-19 (Zahra 2020). This constrained and disturbed supply chains, and therefore, localization was no longer just an option, but a necessity.

However, we can see from both the cases of the repurposed Cubic Bupiji Sauna and the case of the targeted Tiba-Vent, that without strong institutional support, new innovations are unlikely to be timely. Clearly then, entrepreneurial development is highly dependent on its institutional environment (North 1994; Baumol 2005; Aidis *et al*. 2008). The lack of adequate institutional support probably explains why fewer innovations come from developing countries, and why it is common for entrepreneurs in developing countries to have to wait for long periods – all the while paying extra costs – to obtain required government services and licences for business (Zhou 2017). In the end, therefore, although the novelty of Tiba-Vent was exciting, the cumbersome regulatory environment prevented the innovation from being adopted in a timely manner.

Conversely, the urgency of the situation led the Tanzanian government partly to deregulate the license and clinical trial processes for traditional remedies, to allow fast-tracking of the use of remedies such as Bupiji and its accompanying cubic sauna. Without that institutional support, it would have been much more difficult for the entrepreneur's idea to materialize on time. It is probable that people's willingness to tolerate risk increases during a crisis, therefore, some de-regulation allows for those willing to accept some risk for the sake of survival to try new solutions, even when they are not fully tested or proven. However, it is still important to regulate

risky innovations to safeguard targeted users. In the case of Tiba-Vent, the careful processes of legitimating the innovation were important. There are many historical cases where people from the global south were subjected to unethical clinical trials, without their consent, which severely harmed them (Jintarkanon *et al.* 2005; Salhia and Olaiya 2020). However, some of the bureaucracy that made the process longer than necessary could have been avoided. The case of Tiba-Vent shows us the importance of institutional preparedness, especially during a crisis, to allow for new innovations without risking lives.

Third, we found that the innovations had a transformational impact on both the entrepreneurs involved and society at large. Indeed, perceived prosocial impact positively influences individuals, transforming their outlook (Sonnentag and Grant 2012). The innovations of both Tiba-Vent and the cubic sauna brought pride to the entrepreneurs in that they were able to help their communities. For example, not only Cynthia Thuo realized her potential during the process of creating Tiba-Vent, but most of the other students involved in Tiba-Vent have gone on to take part in new ventures and new innovations to help their communities, showing that they have maintained their prosocial attitude beyond the crisis that prompted their first innovation. Furthermore, the positive effect of the two innovations spilled over into the community, inspiring the birth of further localized solutions. For instance, the novel innovations, designed, developed, and manufactured locally created a shift in mindset so that Africans are now aware that it is indeed possible for them to come up with local solutions to their problems, which in turn sparked an upsurge in innovation. While all this might seem a simple matter of fact, it has not always been the case. The narratives insisting that Africans are dependent on others have been common for many years (Taylor 2016) and explain the irrational fear that somehow, Africans would not be able to do anything themselves during the pandemic to mitigate its effects. However, the different innovations that arose during the pandemic dispelled the myth that Africans are somehow different from other people; Africans are of course just as capable of resilience in the face of a global crisis.

Lastly, the different directions followed by the Kenyan and Tanzanian innovators illuminate the impact of narratives and discourse in encouraging entrepreneurship and the spotting of an opportunity. Buchafwe's traditional route may be explained satisfactorily as the promotion to the leaders of Tanzania of traditional remedies against the threat of Covid-1. During a

famous speech, Prof. Anna Tibaijuka, a Tanzanian member of parliament, said (Tibaijuka 2020):

> "Our community needs survival strategies. No society will sit around for death, we must look at our local knowhow and traditional alternatives to cure respiratory problems (...) I have already written a formal letter to the ministry of health that we must also look at option B. I am not saying we shouldn't do option A – wearing masks and looking for ventilators. However, when hell breaks loose [we need to use our own alternatives]."

The narrative in Tanzania was therefore vastly different from that in Kenya, which adopted many measures as per the WHO recommendations (Crisis24 2020). We propose that the difference in the narratives of elite leaders most probably influenced the opportunities the entrepreneurs saw in the idea they had to help the fight against the Covid-19 pandemic.

Limitations and Conclusion

In this exploratory study, we have aimed to raise empirical and theoretical curiosity around African innovations during the Covid-19 pandemic. However, we must acknowledge the chapter's many limitations. First, we came quite late to the process of contributing a chapter to this anthology, so we had only a short time to explore the phenomenon of African innovations in response to Covid-19. Although we should have been delighted to include many other innovations from the broader African context, we were forced to limit our scope to Kenya and Tanzania in East Africa and had time to discuss only two innovations. The limited scope and time allowed us to conduct only three interviews and to consult only a handful of archival sources, both of which limitations expose our study to generalizability challenges. Nevertheless, we hope our findings will inspire others from various research traditions to explore the theoretical and empirical findings we have contributed to this chapter in wider contexts, on broader scales, and with more robust studies.

It is undeniable that the Covid-19 pandemic has had and continues to have devastating effects on communities worldwide. And while it might be difficult to see a silver lining for such a tremendous loss to the world, perhaps the best and most uplifting lesson from the pandemic is that entrepreneurship in the face of a crisis can help communities resist its threats. Entrepreneurship brings solutions and helps alleviate problems due to such

crises. However, such entrepreneurial resilience attributed to societal resilience is born of collective processes and support. More than ever, we see the importance of the role of institutional support for innovation, which can lead to the resilience of communities. We hope the efforts featured in this chapter will help illuminate what can be done to improve innovative capabilities within African countries because indeed, there is great potential for African-led innovations to address societal problems across the world.

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Appendix: Data analysis

Aggregate dimension	Second order themes	First order categories	Examples
Trigger for collective innovation	Fear	Fear of the pandemic	After Covid-19 hit, there were a lot of new innovations. It [Covid-19] came too quickly and struck fear into the hearts of many. Everyone decided to protect them-selves. It's completely different from malaria, which we found when we were born (Zelafi 2022).
	Collective processing	Emotional regulation	We had the IEEE club, or rather organization, and we were very agile, using the team we came up and brainstormed about what we can do (Thuo 2021).
		Peer support	I remember one day we failed to create one logic, one of the modes in the ventila-tor, so I called someone from the medical team, and all of us (engineers) sat down with books and pens and he explained to us how humans breathe, and we visual-ized how to mimic that with a machine. So, that's how diversity helps. Calling in those 15 guys was the best idea (Makatia 2022).
		Mentorship	We were supported with a good structure to carry out the process. At first, we were doing it at our own student level, and we were given a team of mentors by the VC, in electrical, mechanical, biomedical, medicine, nurses, anesthesiologists, surgeons, to support us. That's when we had a good structure, and we were down to review-ing our designs according to criticisms from mentors, and we improved them until we were able to do the prototyping (Kabugi 2022).
Type of innovation	Collective innovation	Teamwork - peer support	So, we had to divide the group, we had to ask the group, how many members wanted to participate in this kind of project. And we divided the group into several teams – electrical, biomedical, research, design. From there, we were able to start smaller WhatsApp groups. I was in the electrical group. We went first researching, how a ventilator is made, what are the components, what are parameters, what are the standards, how does it work, the current challenges with ventilators in the field... after we got all that information, we could do regular meetings online. From that, we sent a lot of research materials and agreed as a team on the direction we should go. So, after we had a good picture, that's when we decided to have the design. The mechanical team was last to design because we started with electrical (Kabugi 2022).
		Institutional support - resources	The university gave us all the resources, all the money we would require - food, accommodation, and everything. Part of that was because the entire country was alert, and everyone was waiting, including the president (Makatia, 2022).

Aggregate dimension	Second order themes	First order categories	Examples
Type of innovation	Collective innovation	Leadership - team management and project management	Some skills are important beyond technical skills – team management skills, you need to understand each and every team member and how to get to them. My team was diverse in gender, so I had to talk to each individual differently. I needed to learn how to manage each team member individually because each of them had a different thing that got to them if you wanted results. Each of my team members was bright, and everyone thought without them there was no ventilator, which was right, but some of them got it into their heads, to start treating others badly, so I had to learn how to manage all these talents and make sure deadlines were met and keep morale up (Makatia, 2022).
		Multi-disciplinary team	That day we failed to create that one logic in one of the modes in the ventilator and called someone from the medical team, all of us knew that time was of the essence in innovating this machine, so one hand could not finish the job. And there was also an issue of diversity because one man can only have his perspective, but there are people with other perspectives. So, when you bring a team together, you have the most optimal idea. What you think is right, someone may analyse it and find faults in it. That's why, the team had guys from pharmacy and nursing, people who actually use the machines on patients. Doctors understand the human body, but engineers understand machines, the physics (Makatia 2022).
		Prosocial benefit	At first, we never thought about commercializing, our main aim was to do designs, create prototypes, get them to our mentors so they approved the designs, and share the information with other students from other universities or manufacturers so that they could produce them. We were trying to volunteer our skills to help the healthcare system (Kabugi 2021).
	Targeted innovation	Localized innovation	Africa has unique challenges, so we can't transfer technology directly, the best thing we can do is to create tailored solutions, so we can have more impact (Makatia 2022).
		Problem-specific innovation	I saw we had very few ventilators in the country. We were looking at the gap to see what would be most effective to help manage the Covid19 situation, to save lives. I saw it as a critical tool in saving lives and Covid management (Kabugi 2022).
	Top-down innovation	Innovative idea came from the leader/ entrepreneur	After Covid-19 hit, there were a lot of new innovations. It [Covid-19] came too fast and struck fear in the hearts of many. Everyone decided to protect themselves. It's completely different from malaria, which we found when we were born (Zelafi 2022).
	Repurposed innovation	Using old technology in a new way	We have been researching to find a medicine to help curb transmittable and non-transmissible diseases. In our research, we have created Bupiji, together with the cubic Bupiji Sauna (Buchafwe 2021).

Aggregate dimension	Second order themes	First order categories	Examples
Conditions for innovation	Leadership	Flexibility	As a team leader, I had to be flexible and willing to learn, not be stuck in what I already know. Being willing to listen and learn from others. Some of these skills I had learned as the head of IEEE on my campus, and the head of Google on my campus, so some skills I had, but some I had to learn. Patience, for example, I had to learn patience with myself, others, and the country.
	Institutional support	Policy support - deregulation	There is a big uptick in making and using traditional treatments. Many citizens use traditional remedies. We aren't saying people who use traditional remedies shouldn't go to hospitals and receive formal care, I advocate for combined therapy where both are used hand in hand... We are in an era when traditional medicine use is rising in our country like in other countries – China, Korea, India, and even Ghana (Gwajima 2021).
	Institutional hurdles	Lack of adequate policy support	We went through a lot of challenges when we were going through the required bodies, like the Kenya Bureau of Standards (KEBS) and the Pharmacy and Poisons Board (PPB). Kenya didn't have a standard for manufacturing a ventilator. There had never been a locally manufactured medical device, so they didn't have any standards to work with... It took so long in PPB – eighteen months – because they did not have any standards for that, and they were scared that they could kill someone and would get sued (Makatia 2022).
Transformative effect	Individual transformation	Maintain prosocial behaviour	We started an initiative with a few friends where we are going to primary schools to teach them robotics and electronics, we call it Young Savvy, to inspire, and ignite the engineering spark in young people (Kabugi 2022).
		Build self-efficacy	It made me see my own potential (Thuo 2021).
	Societal transformation	Mindset change	This is to show that, Tanzanians have the ability to do research, and we have re-searched how we can solve problems that face Tanzanians (Buchafwe, 2021).
		Create hope	That was a great hope to Kenya, at least they saw there was something we could do (Thuo 2021).
		Spillover effect for more innovations	After Tiba-Vent, we had an outbreak of innovations like ICU beds in Kenya, local-ly made test swabs, facemasks, and handwash stations after the ventilator went viral. We inspired people to look at what they have, look at their skills, and use them to help the situation (Makatia 2022).

Globally, small and medium enterprises (SME) entrepreneurs were hit hard by the Covid-19 pandemic and subsequent measures such as lockdowns and market closures. Africa was no exception. Entrepreneurial intentions and activities were expected to have a broad downturn with established entrepreneurs being forced to downsize or quit their businesses, while fewer novel entrepreneurs entered the market and started their own companies. At the same time, entrepreneurship is considered one of the few viable options to ensure an income during uncertain economic times. Furthermore, the Covid-19 crisis was said to drive innovation and technological advancements globally, and perhaps even more so in Africa due to its young demographic.

This edited volume includes insights gathered during the 2021 NVAS Africa Day which had the theme: 'entrepreneurial responses to Covid-19 in Africa.' The volume shines a light on two broader themes: entrepreneurial intentions and entrepreneurial resilience in Africa in times of Covid-19.

ISBN 9789463014328

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Eburon
Academic Publishers