Transforming Education for Sustainable Futures: Intersecting dynamics of food, water, livelihoods and education in the COVID-19 pandemic

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Abstract

Since 2019, the COVID-19 pandemic has posed challenges to but also highlighted the urgent need for transforming education for sustainable futures. The purpose of this article is to share insights gained from a southern African study on intersecting influences of water, food, livelihoods and education, and what they mean for Education for Sustainable Development going forward. The interest is to learn from this study in ways that can inform transformation of education for sustainable futures in southern Africa going forward. The study involved a number of early career researchers in SADC countries, and was conducted via an online approach during the early days of the pandemic. It followed a qualitative research design, employed document analysis, interviews and questionnaires, and drew on a systems perspective to inform analysis. The findings are as relevant today as they were in the pandemic, and point to the importance of giving attention to intersecting issues that affect education. The study highlights six transformative praxis pathways for transforming education for sustainable futures.

Keywords: *COVID-19; education for sustainable development; systems thinking, intersectionality*

Introduction

COVID-19 erupted as a health pandemic (World Health Organization, 2020) that spread at an unprecedented rate across the world including Africa (SADC, 2020) where it changed the social and economic landscape of local communities (Association for the Development of Education in Africa, 2020; Thobega, 2020). It was immediately obvious that in Southern Africa, access to food, water, health services, the means to create livelihoods, and education were impacted by intermittent lockdown strategies implemented by governments to curtail the spread of the virus. The challenge observed in the early period of the pandemic, is that this resulted in the exacerbation of the inequalities that already existed in the region (Hobbs, 2020; Phakathi, 2020), especially with regard to education.

At the time (June 2020), the Joint Education Trust, working with UNESCO's Regional Office for Southern Africa, called for a 'Researchers Challenge' constituted as a rapid study involving early career researchers from across southern African countries to investigate various dimensions of the COVID-19 pandemic and its implications for education. Our team decided to focus on intersecting perspectives on why water, food and livelihoods matter in transforming education for sustainable futures (Lotz-Sisitka, et al., 2021). As has been said by many, the COVID-19 pandemic required us to think in radically new ways about existing systems and how they have been operating. It required us to consider 'building forward better' giving attention to social justice and sustainability in recovering from the pandemic (ibid.). It continues to require us to act more collectively, systemically and inter- and multi-sectorally in response to the heightened sustainable development challenges revealed by the pandemic. In our research project, we were curious to interrogate how the COVID-19 pandemic and its impacts can provide educators and scholars with a unique generative opportunity to learn from the intersecting issues to inform transformation in education systems towards sustainable futures in southern Africa.

At the height of the pandemic, there was much uncertainty as to how the pandemic would play out in the Southern African Development Community (SADC). "The socio and economic impacts of COVID-19 in SADC may be unprecedented due to resource limitations and inadequacies in health systems in many of the Member States" (SADC, 2020, p. 2). Although authorities in Africa emphasised adherence to standardised safety protocols to reduce the spread of the virus, there was, and remains less clarity on how to respond to the longer term 'fall out' of the pandemic in terms of the intersecting issues raised here.

Intersecting perspectives: Food, water, livelihoods and education

One of the most immediate impacts around the COVID-19 pandemic was an increased threat of hunger in the southern African region. Jobs were lost in the hospitality and tourism industry (hotels, lodges, camps, and guesthouses) as airlines started cancelling scheduled routes. Local movement restrictions introduced during the COVID-19 pandemic left people with uncertain livelihood options, without safety nets (FAO, 2020). The resilience of the agricultural sector was also tested by the COVID-19 pandemic (FAO, 2020; Nicola et al., 2020). A global crash in demand from hotels and restaurants saw prices of agricultural commodities drop by 20% (Nicola et al., 2020). In Canada, South Africa, and the United Kingdom panic-buying complicated shortages beyond supermarket shelves (Hobbs, 2020; Viljoen, 2020). COVID-19 lockdown measures disrupted rural-urban agriculture supply chains. Zimbabwe Congress of Trade Unions (2020) noted that rural communities play a critical role in the production and supply of agricultural commodities such as vegetables to farmers' markets. This ecosystem sustains incomes and livelihoods for rural suppliers and urban buyers. However, one of the containment measures for the spread of the virus was curtailment of travel and strict measures for travel permits, which made it harder to travel from place to place. Electronic permit application systems created inequalities. Travel

restrictions, as well as quarantines and isolation measures, and during strict lockdowns, the complete suspension of non-essential social and economic activities by governments, resulted in loss of incomes and increased vulnerability to intense poverty particularly for women who rely on informal markets for their livelihoods.

Some governments initiated food relief packages for needy households. In Botswana, Tutume sub-district council distributed food relief packages across many of the sub-district's 29 local villages (Williams, 2020). Phakathi (2020) reported that during the partial lockdown in Eswatini, small-scale vegetable farmers started producing from backyard gardens. The produce was collected and sold on their behalf in a local farm stall.

SADC countries prioritised access to water in communities and schools in order to uphold the non-pharmaceutical COVID-19 practice of hand-washing. This exposed the fact that many schools do not have a consistent water supply. In Botswana, 88 emergency water delivery trucks were deployed in water scarce areas (Lebanna, 2020). The South African government used water tankers to deliver potable water to some schools (SADC, 2020). The lockdown in South Africa worsened existing inequalities in terms of access to water and sanitation. For example, Khayelitsha informal settlement in South Africa is home to roughly 20 000 people who share 380 communal toilets (Hara, Ncube & Sibanda, 2020). The sharing of communal standpipes and toilets, although still an everyday problem, was a critical problem in terms of dealing with the sanitation measures required to combat the pandemic.

UNESCO estimated that close to 900 million learners were affected by repeated closures of schools (UNESCO, 2020). COVID-19 affected all levels of the education system from pre-school to tertiary education (Nicola et al., 2020). Those in the most marginal of circumstances were the most affected. Schools were no longer able to provide school meals to children from low-income families. Women and girls were found to be more affected by the pandemic (Malala Fund, 2020). Digital access revealed another dimension of inequality. The Eswatini government introduced home learning programmes on television and radio, the Internet and national newspapers like *Eswatini Observer*, with lessons for external examination grades (Grade 7, Forms 3 and 5) (UNICEF, 2020). However, some communities in rural areas do not have frequent access to television and radio because of a lack of electricity. Even buying newspapers became a mammoth task if there were no shops open nearby (*Times of Eswatini*, 2020).
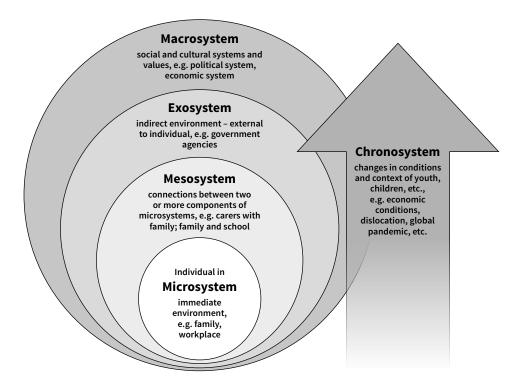
This brief review, which touches only on some of the dynamics of the pandemic, shows the intersecting nature of the issues, and their effects on education, which was the core focus of our research. To make sense of the complexity of these intersecting issues, we needed to develop or draw on a systemic perspective, discussed further below.
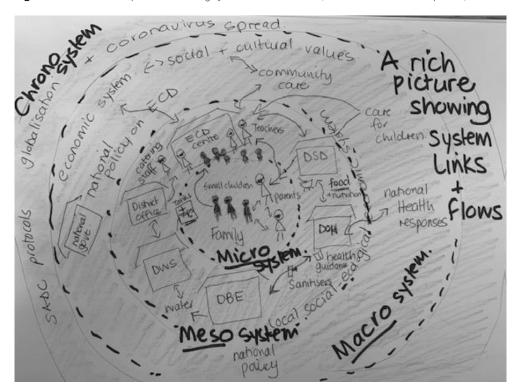
Theoretical framework and methodology

Our research project, conceptualised within the wider Joint Education Trust / UNESCO ROSA 'Researchers Challenge' took place over a six-month period, with most of the research done online and via literature review in a shorter period. In order to make sense

of the complexity of the situation we were witnessing, and that was being revealed in our data, we decided to draw on social-ecological system theory as an analytic lens in the study. Bronfenbrenner (1979) developed a social-ecological system framework that is widely used in educational research to explain interconnecting influences on teaching and learning of children (Figure 1). In drawing on this framework for our initial analyses, we reasoned that a systemic, relational approach would be essential to produce more integrated responses to the intersecting concerns that we were observing and investigating (Lotz-Sisitka et al., 2015; Lotz-Sisitka et al., 2021; Togo and Lotz-Sisitka, 2013). This required us to map our data relationally, taking account of the different dimensions of the system. Bronfenbrenner's social-ecological system explains differences between a Microsystem, Mesosystem, Exosystem, Macrosystem and Chronosystem as shown in Figure 2 below. This model was helpful for us to map out what we termed 'rich pictures' of the situations we were observing (see Figure 2), which was the first step in identifying sub-themes to map out possible responses and transformative pathways for transforming education for sustainable futures.
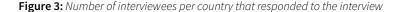
Figure 1: *Bronfenbrenner's social-ecological systems theory (Adapted from Bronfenbrenner, 1979)*
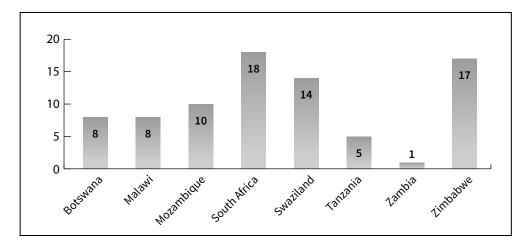
Figure 2: *One of the rich pictures showing system links and flows (Source: Authors' development)*

We used mainly qualitative research methods (Creswell & Poth, 2018) because we were trying to gain an understanding of a complex phenomenon. To contextualise and develop deeper understanding of the phenomena under study, we started the research by reflecting on our own experiences of the COVID-19 pandemic, and also reading and drawing on national and regional literature, seeking out insights into the intersecting concerns in focus. We mapped these initial experiences into a contextual profiling table that gave us a first level of understanding of the way in which the issues were intersecting. Following ethics clearance from Rhodes University, primary data was then collected through interviews and questionnaires while secondary data was gathered through document analysis. Documents analysed consisted of official SADC reports and national media articles with the aim of exploring from across SADC countries, focusing on the intersection of food, water, livelihoods and education. Semi-structured interviews (81) were conducted in June 2020 through face-to-face, virtual platforms such as Zoom, WhatsApp and Skype, telephone, and emailing (see Table 1 for the countries included in the sample). Interviewees came from eight countries (see Figure 3) and all key informants were local people, teachers, parents, learners, youth or government officials (Creswell & Poth, 2018). The interview questions were developed and informed by rich pictures (for example, see Figure 2) which provided

the first level of analysis using the Bronfenbrenner social-ecosystem model as explained above.

Figure 3: *Number of interviewees per country that responded to the interview*

A questionnaire survey (Newman & Hitchcock, 2011) was administered in June 2020 via email to recipients in the SADC Environment and Sustainability Education Community. The questionnaire reached about 400 people of whom 55 responded (13.7% response rate). Questionnaire respondents were from nine SADC countries; most were experienced educators from universities, non-governmental organisations (NGOs), other education institutions and government organisations. The purpose of the survey was to extend insights gained from the researchers' observations, the literature reviews, and interviews. Respondents offered rich data and an extended southern Africa understanding of the intersecting issues.

Data analysis included reading of transcripts to generate emerging examples, categories and themes responding to the key question (Miles, Huberman, & Saldana, 2019). Rich pictures from sub-themes enabled analysis of intersecting issues through Bronfenbrenner's socio-ecological systems lens which explains differences in Microsystem, Mesosystem, Exosystem, Macro and Chronosystem (cf. Figure 1 above). Researchers studied the rich pictures enhancing them with perspectives from literature and data. The initial focus was on analysing data in relation to the literature and data relevant to each theme with each team of researchers undertaking the first level of analysis. This fed into a second level of analysis which took place during the finalisation of the report. Thus the study employed an abductive analysis approach and analysed interconnecting issues relationally between different dimensions.

Findings reflecting the intersecting challenges as experienced by SADC communities in the early COVID-19 pandemic period

The qualitative data offered many interesting perspectives on the intersecting concerns, as briefly outlined below, and further elaborated in the final project report (Lotz-Sisitka et al., 2021). What was evident from across the data sets (interview and questionnaire) is that, like elsewhere around the world, the COVID-19 pandemic struck southern Africa with almost no warning, and across the southern African region the COVID-19 pandemic sadly exacerbated and starkly revealed many of the deep-seated historical and structural challenges in our societies. These are most evident in issues such as the rapid loss of economic security and livelihood access, deepening poverty and vulnerability, lack of access to clean water, hunger, food insecurity and nutrition challenges, increased educational inequalities exacerbated by the digital divide, increases in gender-based violence and challenges for the girl child especially. The following data reveals some of the dynamics identified in our study.

Food insecurity

Issues of price hikes on food products, shortage of food and long queues in shops emerged from data. Interviewees from Botswana and Eswatini stated that owners of grocery stores increased prices of food during the COVID-19 pandemic, thus initiating budgetary constraints. One of the interviewees in Botswana stated: "Food became expensive. Local dealers took advantage of the lockdown". FAO (2020) reported "the pandemic exacerbated price increases and analysis of food price trends showed that 20 of the 24 countries for which data are available recorded increases in staple food prices in June 2020 compared with February 2020" (p. 4). SADC (2020) also reported "Covid-19 has brought to the fore uncertainty in future demand which has led to weak commodity prices" (pp. 3-4). One of the interviewees in South Africa stated:

> I noticed that many people have lost their jobs due to the heavy lockdown period. This has led to food insecurity and large numbers of people in our community are reliant on food parcels which have been handed out by community organisations and Department of Social Development.

Shortage of food in most households was aggravated by the fact that people's movement was restricted. Even in rural places local people needed a permit to visit their farms which they used to visit all the time. An interviewee in Eswatini stated: "Our local shop provides fewer supplies. Residents consider buying from town. We were not able to get some food products locally". In Malawi, an Anglican Secondary School that raises broiler chickens for feeding students in the boarding school closed and it was left with many chickens and no students to feed. The school had to sell chickens at a low price to avoid losses. A primary school in Malawi also realised that due to school closure, the flour used for the school feeding programme was beginning to expire. COVID-19 revealed a significant crisis in food access and supply.

Water supply

While permanent water and sanitation systems are a distant hope in many learning institutions in the region, access to water during the pandemic became a key focus of some governments. For example, one interviewee stated: "Not experienced struggle in accessing water. Closed pipes were opened by Water Utilities Corporation to enable locals … easy access to water" and "Our area is characteristic of extreme lack of water, but since the eruption of COVID-19, water has been available". It seems that in these cases, the pandemic conditions urged governments to provide water to areas that would not normally have such access. For others sufficient water supply was not guaranteed; for example, this interviewee in Zambia stated that accessing water regularly to wash hands is a complicated process: "Even where I stay in Chilenje Township, we buy water every week from Lusaka Water and Sewerage Company. We are connected to this company, but we seldom receive water". An interviewee from Eswatini stated that the government failed in providing communities with running water. In Zimbabwe, the interviewee said, "I am working in a community involved in market gardening for livelihood, but experiencing water shortage even for domestic consumption".

Such intermittent water availability was reported to also link to food shortages and this intersection had further implications in the education system. Students were not able to practise hygiene to safeguard against infections, and they were not able to attend school due to lack of water, with reduced food at either home, or school, or both affecting their ability to learn. This questionnaire response from Zimbabwe, clearly outlines the interrelated nature of the concerns:

> Currently I am working in a community involved in market gardening for livelihood but experiences water shortage even for domestic consumption. Since the water required for hand washing is supposed to be moving, larger amounts of water are therefore required for WASH activities while the constant water is not available. The borehole supplying water to distant community garden is not yielding the required amount of water and the people usually augment this supply with hiring vehicles to source water from the nearest town. However, the town is now reserving all available water for the local residents as part of the town's strategy to combat COVID-19. At the end this community has lost its crop due to lack of water for irrigation while at the same time there is shortage of water to allow appropriate washing of hands. All of this is happening while children are out of school putting pressure on the little food and water supply available to the households.

Health

With regard to health, interviewees raised concerns varying from stigma, trauma, fear and social distancing, to commitment from health authorities, among others. A respondent working for an NGO in Zimbabwe stated that:

> During emergencies like the COVID-19, access to family planning is critical. Government must ensure that there is timely access to contraception, including emergency contraception to avoid unintended pregnancies, which can have significant impacts on women's lives and health.

A nutritional officer in Malawi stated:

> We need capacity building to volunteers such as care groups that pass messages to communities. Care groups are not aware of COVID-19. In case of a suspect, they would be aware on how to handle such cases. For girl child, they are at home. They can be supported with a ration like porridge they used to take at school. Otherwise girls will be malnourished potentially affecting performance at school.

The pandemic understandably affected health officials. A nurse in Botswana stated, "Even though it was a scary moment, I have pledged to help the nation in this kind of unforeseen health issues". Clinics and other health facilities encountered high number of patients seeking medical assistance. Due to crowding, social distancing was not always observed. An interviewee in Eswatini stated, "Because of social distancing, nurses were not able to attend to all of us, because of the restrictions of the number of patients". A nurse confirmed: "Access to health care services was negatively affected as few individuals were allowed [at the health facility] at a given point in time and patients came back later when they were now severely ill". Astonishingly, one interviewee reported that the local clinic provides health care services "only to their employees and their immediate family members. Minorities that stay in those villages had to travel to other places to access health care. Travel permits were not easy to get".

Education

COVID-19 caused changes to school calendars, discomfort among learners and teachers alike about going back to school, exacerbated inequalities in digital learning and the low quality of education. Even resourcing of schools was affected. An interviewee in Namibia stated: "Many of the issues are interrelated, for example, the tourism industry and education. Many schools and NGOs that provide education to school children receive donations from tourism companies. This has stopped".

COVID-19 negatively and unevenly impacted on opportunities for teaching and learning through school closures. Families had varying access to out-of-school learning resources such as the Internet, smart phones, television and even the radio, which may be affected by limited electricity supply. Some learners were not able to access online learning materials even if they had access to devices at home, due to poor telecommunication and information technology. One of the interviewees in Botswana stated: "The government tried to provide network then it became extremely slow due to overuse as many people rely on it for COVID-19 updates". In Eswatini, the interviewee stated:

> I had three platforms for communicating with students. First, we have a system that students use to access results and lecture notes. Second, I created a WhatsApp group where I posted what they should take a look at and allow them to post questions. Students submitted assignments through emails. Not all students participated due to insufficient funds for buying mobile data and also others complained of network coverage. Some students do not own smartphones.

The intersection of digital inequality, water scarcity, and food insecurity has major implications for transforming education. When schools closed, school nutrition programmes usually came to a halt as well. Halting of the school meals led to undesirable societal behaviour, as one interviewee noted: "Sometimes one sees children moving from house to house begging for food. They get exposed when going around and that could lead to more dangerous incidents like kidnapping and rape".

Furthermore, findings suggest that it was difficult to continue teaching, and learners forgot about school leading to silent drop out. "Our children suffered a lot. They did not receive any form of education. Standard seven, form three and form five students were given homework but they did not do because they needed further explanations from their teachers," said one of the interviewees.

Informal economies, different contexts and educational spaces:

Disruption in informal economies was evident in the data. High prevalence of women in informal economy (and in the health and care sectors) means that more women were at risk of infections. One of the researchers in this study described his country context:

> In Tanzania, the government said that everyone is supposed to wear a mask and every shop supposed to have a bucket of water with soap to handwash customers. Those who have money can buy sanitisers compared to water. Some schools don't have running water. Young girls face challenges on issues of hygiene. This was the challenge before COVID 19 … but after COVID-19 the challenge is becoming intense.

> Another South African researcher in this study described her country context:

> My concern is around people who rely on informal economies … how they would manage? Many people have lost jobs. Businesses have shut down. A few people in my neighbourhood were concerned about the informal vegetable store. While supermarkets were able to continue operating, the vegetable store owner was not able to continue operating.

Two of the researchers revealed experiences of living in different contexts in their countries. They both attempted to use graffiti as a way to communicate about COVID-19. The experience revealed differences in the broader structures governing the two countries. In Tanzania, the researcher together with other young people created graffiti art that represented the COVID-19 pandemic. However, in South Africa, a researcher doing the same received a negative reaction. When she noted that COVID-19 positive cases were increasing in the neighbourhood and people barely wore masks, and did not adhere to social distancing, she decided on a chalk graffiti intervention. Without any volunteers to join her, she chalked a message on one of the main streets: "83 cases, Our response matters, Wash hands, Wear masks and Keep distance". While she was finishing up the work, a security officer approached and took her details down. The officer said it was his job to report any odd behaviour.

These and other detailed qualitative responses from across the SADC countries showed that there is a close relationship between the past and the experiences of communities across the region. Summatively, mapping these out as outlined in Figure 4 below, helped us to begin to see what could be done going forward. This informed our main recommendations from the study.

Figure 4: *An overview of the findings of the study from a past, present and future perspective*

PAST (what was there before COVID-19)	PRESENT (COVID-19 period)	FUTURE (building forward better)
■ History of inequalities in SADC region	■ Inequalities more starkly revealed	■ Need economic and policy tools to combat inequality
■ Poverty and precarious livelihoods for many; many children dependent on school feeding schemes	■ Precarity of livelihood highly visible leading to food insecurity and job losses	■ Youth organisation and employment programmes
■ High unemployment, especially amongst youth	■ Youth affected further by unemployment and economic impacts of COVID-19; but also reveal their agency for organising	■ More sustainable food systems are needed
■ Corruption in some countries; lack of inter-sectoral partnerships	■ School feeding schemes closed under lockdown, leaving children hungry; government and community based food parcel responses (short term) with some social grant support in some countries	■ School and community food gardens, better support for farmers and land sovereignty
■ Water resources not reaching all people, especially in rural areas and informal urban settlements	■ Some communities without water, even for handwashing requirements; governments working with partners to supply emergency water infrastructure	■ More sustainable water supplies to schools and communties
■ Southern Africa is a dryland region, and experiences periodic drought and flooding, with climate change also affecting food production	■ Private schools threatened due to lack of ability of parents to pay in some cases	■ Social grant systems to be more stabilised as substantive safety nets for families at risk
■ Divide between private and public schooling	■ Digital divide much more obvious; data becomes a big cost for families	■ Strengthen emerging inter-agency and multi-sectoral partnerships for sustainable development action
■ Unequal access to ICTs; digital divide	■ Girl children lose safe spaces of school, more vulnerable	■ Improve quality in public schools to avoid the public-prvate school divide
■ Gender inqequalities and patriarchial culture; affecting girl children		■ Free internet services and better access to supply and use of ICTs for education
		■ Create platforms for girl children's safety and well-being in times of risk and vulnerability

Discussion and Recommendations

As indicated above, it was our interest in this research to explore the intersecting issues of water, food, education and livelihoods in order to identify what can be learned from the COVID-19 pandemic for transforming education for sustainable futures in southern Africa.

The findings show that COVID-19 clearly influenced the intersection of water, food, livelihood and education, but also that there are possibilities for transformation existing at the various levels of the system, that shape and influence each other. We identified that changes can be made at all levels of the system, most notably:

Macro- and meso-level involving government

1. School-community-government partnerships: Here we identified that school-community-government partnerships need to be strengthened, as our study revealed fissures between schools and communities or parents, and schools and government partners.

2. Inter-governmental collaboration on water, sanitation, nutrition: Here we identified that inter-governmental collaboration on water, sanitation and nutrition was crucial to provide safety nets for children when faced with exacerbated vulnerabilities such as those experienced in the COVID-19 pandemic.

Micro- and meso-level involving individuals and communities

1. Acceleration of sustainable solutions at community level: The pandemic showed the urgency of working with communities to accelerate sustainable solutions at local levels in response to the intersecting water, food, livelihoods and educational challenges experienced. Suggestions were to make better use of indigenous knowledge, grow more food locally and strengthen local systems of livelihood construction.

2. Roles of parents, teachers, community members: Parents, teachers and community members were very important responders in the pandemic, they were the ones that helped children to keep learning, and to make plans to manage the fallouts in livelihoods. Stronger solidarity relations between parents, teachers and community members were therefore found to be important in dealing with the intersecting vulnerabilities such as those produced in the pandemic.

3. Role of youth, informal learning and response-ability: Our study showed that youth are largely excluded from mainstream discussions on the responses in the pandemic, yet in many cases we found them to be the most agile and able to respond in their communities. This raised the importance of thinking about the response-ability of young people in our societies, and recognising the agency and strengths that they bring.

4. Role of gender (including safety of girl children): We noted in our findings that women were most heavily affected by the pandemic; this therefore highlights the importance of strengthening gender justice at local levels.

5. Implications for livelihoods (including SME start-ups, new economic opportunities surfacing, etc.): The massive fallout of livelihoods in the pandemic showed that there is

need for more flexible economies and more investment is needed for supporting start-ups and enterprises that work at local levels.

The findings summarised briefly above, show that micro-systems consists of individual and community experiences in relatively small-scale interactions, yet responses at this level are vitally important to strengthen relational solidarity and sustainable livelihoods. The meso-system consists of institutional forms, organisations, cultures, functions and roles and practices at, for example, a district level, and here we noted that there was need for improved partnerships and relationships. Exo- and macro-systems consists of larger institutions and structures at the national level (e.g. national governments' health responses) while the mega-system consists of global processes such as SADC protocols. It was evident that generative histories, structures and mechanisms influence each other at the above system levels. For example, observation of price hikes in food and of local dealers (at the micro-system level) taking advantage of lockdowns (emerging from the macro-system level) confirmed reports from the literature (FAO, 2020; Nicola et al., 2020) that consumers were paying more for food products. The hospitality and tourism industry (at all levels or systems) showed how local livelihoods were impacted by the macro-system level phenomena of the pandemic and globalised borders and trade relations. As shown in our qualitative data (see also Lotz-Sisitka et al., 2021), the pandemic reduced the well-being of people in multiple ways through loss of money to buy food and fewer opportunities to produce their own food. This was exacerbated by children losing access to school-based nutrition programmes and by water issues. Overall, this impacted in various ways at household level, and on educational possibilities and opportunities during the pandemic. But it is also here that people were mobilising themselves to respond to the pandemic in ways that they could.

Viewing the findings on past, present and future in Figure 4 above, it is also possible to see that what is needed in future is also an absence in the present; it is something that is 'not there yet' and needs to come into being within a just recovery or during the process of building forward on a better trajectory. This is necessary if we want to avoid sinking back into those aspects of the past that were not working well for people in southern Africa, and if we want to mobilise transforming education for sustainable futures work in ways that can help communities, teachers, government officials, business partners, and all societal actors to work out and put in place alternative ways out of contemporary ills as revealed by the COVID-19 pandemic, and if we want to strengthen our agency for change.

As indicated in the study overall (cf. Lotz-Sisitka et al., 2021), **agency for change** (individual and collective) was present in all research sites, despite the difficult histories and at times dire conditions. Parents took on the work of teachers, farmers helped each other, government officials formed new partnerships with each other, and people generally shared what they had in order to help others out. Youth played an important connecting role, and teachers adapted to the digital demands of new technologies, in spite of the many difficulties. Interestingly, one of the features of this agency for change during the pandemic was the **formation of new partnerships, relationships and coalitions at community**

level, but also at inter-governmental levels, for example in South Africa where the Department of Water Affairs assisted the Department of Education with water tanks for schools. Building forward better together based on this important finding can help to chart a pathway forward for transformative praxis that is grounded in the realities of people in the here and now, and that can be taken up at multiple levels of the system as per the conceptual framework guiding this study.

With this in mind, we identified six **'transformative praxis pathways' for transforming education for sustainable futures** going forward. These are:

- *Transformative Praxis Pathway 1: Education, training and social learning that contributes to articulating economic models that are more inclusive and sustainable.* There is a need to invest in education, training and social learning that is oriented towards more inclusive, sustainable economic models that leave no-one behind. Such economic models should be more strongly community-based and should strengthen local economies, as well as mobilise the potential of green, circular and re-generative economies. This transformative praxis pathway specifically impacts economics education curricula where new economic thinking needs urgent attention.

- *Transformative Praxis Pathway 2: Education, training and social learning to contribute to the emergence of more sustainable food systems for all.* Education, training and social learning is needed to develop knowledge of the entire food system and the food value chain, and this can help to develop active production praxis of farmers (including via education) to address land access and access to the resources and knowledge for improving farming, and food production at household and community levels. Additionally, there is need for education along the food value chain to strengthen ethics and accountability across the food value chain including in marketing, distribution and supply systems, not only the production system. A whole system approach is needed that is oriented towards sustainability, inclusivity, fairness, human dignity and access to adequate food. Agro-ecological approaches and food sovereignty principles need to be part of this approach to food system development, as do anti-corruption approaches and values. Such education and learning should include a stronger focus on climate change adaptation, indigenous knowledge and multiple forms of knowledge in education, training and social learning in the food system.

- *Transformative Praxis Pathway 3: Education, training and social learning to strengthen inter-agency and multi-sectoral partnerships for sustainable development action and service delivery.* As shown across our study (cf. Lotz-Sisitka et al., 2021 for further detail), lack of sustainable supply of clean water heavily impacted on communities and schools' abilities to respond adequately to the COVID-19 pandemic with many impacts across the system, including longer than necessary closures of schools which in turn impacted on the school nutrition schemes, and exacerbated food insecurity. This same problem also affected health workers, teachers, and families who are challenged with inadequate access to a clean, sustainable supply of water. New innovative strategies should be introduced into inter-agency and multi-sectoral partnerships such as use of solar pumps and rainwater

harvesting practices, that build on community knowledge and indigenous practices. Communities should be consulted in planning of interventions that are meant to facilitate sustainable development action and service delivery, and should be included in co-creating these solutions.

■ *Transformative Praxis Pathway 4: Strengthen quality education in the public education sector and facilitate access to ICTs and stronger parental participation.* Our study showed that it was children in public schools that were most heavily affected by the pandemic in terms of learning continuity and access to resources (cf. Lotz-Sisitka et al., 2021). This indicates that there is a need to strengthen quality education in the public sector to address the current divide between public and private education. As reported across our study, one of the most obvious divides between public and private education is equitable access to and use of ICTs in education. This particularly affected children from poorer households and children in rural areas with access to and use of ICTs for online learning. This is a macro-level systemic issue that will require setting systems in place for providing free Internet services, and better supply and access to ICT devices and tools. It also involves providing support to teachers to design and develop online learning approaches. Community-based approaches to supporting children's education in times of crisis are also needed as not all parents are able to take on the role of educators.

■ *Transformative Praxis Pathway 5: Strengthen interventions that support the inclusion and safety of women and girl children, and youth agency for change.* Women and girl children emerged as being some of the most vulnerable in society and were also most at risk of loss of economic security, and were most impacted due to their traditional roles as caregivers in society and in the health care sector. There is a need for strengthening of interventions that support the inclusion and safety of women and girl children in education and learning for sustainable futures, and that validate and create spaces for youth agency for organisation and change. In our study, young people were found to have capacity for imagining alternative futures, and agency for organising, crossing boundaries in their communities and contributing to multi-levelled and multi-facetted forms of awareness raising and public education (cf. Lotz-Sisitka et al., 2021). The study also showed that many young people are facing the spectre of permanent unemployment and there is therefore a need to give attention to programmes and spaces for young people to access resources, and platforms that can better support their agency for change. It is important especially to give attention to the boundary zones between formal and informal education and new modalities of learning that can be made available to young people, especially also through coalition building and use of ICTs.

■ *Transformative Praxis Pathway 6: Strengthen multi-levelled and multi-disciplinary policy interventions to strengthen sustainable development of society at all levels.* The intersecting concerns in our study revealed that policy development processes for education for sustainable development and transforming education for sustainable futures going forward needs to be multi-sectoral and multi-disciplinary. Such policy development processes require that the range of stakeholders that were shown to have an important

response role in this study (including but not limited to education sector actors, water, food and livelihoods development actors, gender activists and other actors concerned with human well-being, social justice and wider concerns such as sustainable development in the SADC region) should be included in Education for Sustainable Development policy and practices. Co-operative governance and special efforts are needed to ensure policy synergy. As we saw across our study, policy disjuncture's between water and food systems, or water and education systems, or education and social welfare systems can have extreme adverse effects in times of crisis. For this reason, building forwards better, enabling just recovery and transforming education for sustainable futures moving forward should adopt multi-sectoral and joined-up approaches to policy within a wider social justice and sustainable development framework that is oriented towards addressing historical marginalisation and ensuring equity of opportunity for all.

This study (see also its more extended report: Lotz-Sisitka et al., 2021) has shed light on the complex systemic relationships that exist when we seek to transform education systems for sustainable futures. Overall, we sought to make recommendations that can help to frame transforming education for sustainable futures conceptualised within a socially just 'build forward better' together approach to creating a future out of the present and the past. Our intention was to identify what could be learned for transforming education for sustainable futures out of the current COVID-19 pandemic context.

Our study purposefully sought out the qualitative voices of those most affected by the pandemic from a diversity of perspectives and vantage points, of which we could only share a few in this article (refer to Lotz-Sisitka et al., 2021 for more detailed views and voices). We have offered recommendations that can inform a multi-levelled response and a wider systemic response to the intersecting challenges that were revealed so starkly in the pandemic, in ways that also offer clear transformative praxis pathways for transforming education for sustainable futures work going forward in the SADC region.

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