

How Global Shocks Affect Small-Scale Farmholders

A Case Study of Access to and use of Fertiliser in Morogoro,
Tanzania



LUNDS
UNIVERSITET

Acknowledgements

First of all, I would like to thank all the people who have helped and supported me during my field study in Tanzania. I want to give a special thank you to the team at AgriWezesha and my interpreters, and Deograsia, for being so delightful and helpful during my stay in Morogoro, for all the help with knowledge and contacts, and for making this research possible.

I would like to thank Sida for granting me a Minor Field Studies scholarship that made it possible to conduct my minor field study in Tanzania, and in doing so, write this thesis. Additionally, I want to thank Agnese Pacciardi and Anders Uhlin, my supervisors at Lund University, who helped me craft the base concepts of the thesis, during and after the field work. I want to thank Alma, with whom I went to Morogoro, for being a good friend and colleague, but more importantly, a great sister who always supported me and shared my experiences. I want to thank Odd and Marit for welcoming me into their home, helping me acclimate, and sharing their wisdom and always showing support.

Finally, to all the people who honored me with their time and participated in the study, you have my gratitude, without you none of this would have been possible, thank you.

Abstract

The thesis is a qualitative case study on how global shocks, specifically COVID-19 and the war in Ukraine, affect small scale farmholders, and their use of and access to, fertiliser. The study aims to explore how the global affects the local, and what factors may ameliorate or exacerbate farmholders' situation. The study was conducted through field work in rural Morogoro, Tanzania and data was collected through semi-structured interviews with rural small-scale farmholders. Inductive thematic coding was used when analysing the data, to allow the data to identify common themes throughout the interviews. The field study was conducted from January to March 2023, and aimed at identifying and understanding what factors affected farmholders' use of fertiliser, and how their access to them had changed. PESTEL was used to create a contextual analysis, which was used to analyse the findings of the study. The study found that fertiliser access and use had both been negatively affected, and that mitigation strategies were lacking. Lastly, the thesis highlights the importance of further research on the subject, and recommends possible scopes of future studies.

Key Words: Fertiliser, Global Shocks, Covid-19, Ukraine war, Small-scale Farmers

Wordcount: 9497

Table of Contents

Acronyms.....	6
1. Introduction.....	1
2. The Case.....	2
3. Research Questions and Aim.....	3
4. Previous Studies.....	3
4.1 COVID-19 and Fertiliser.....	4
4.2 Global Effects on Commodity Prices.....	4
4.3 Fertiliser Prices & Hunger.....	5
5. Methodology & Empirical Material.....	5
5.1 Research Design.....	5
5.2 Conducting Data Collection.....	6
5.2.1 Host Organisation.....	6
5.2.2 Sampling & Accessing Participants.....	7
5.2.3 Conducting the Interviews.....	7
5.2.1 Translator.....	8
5.3 Data Analysis.....	8
5.4 Ethical considerations.....	9
5.5 Strengths & Limitations.....	11
6. Analytical Context.....	13
6.1 Political Context.....	13
6.2 Economic Context.....	14
6.3 Social/cultural Context.....	15
6.4 Environmental Context.....	15
7. Results.....	16
7.1 Has fertiliser use among small-scale farmholders been affected since the outbreak of COVID-19 and the war in Ukraine?.....	17
7.2 Do small-scale farmholders have alternative strategies, in light of fertiliser price increases?.....	17
7.3 Are farmers having trouble accessing fertiliser despite the subsidy program?.....	18
7.4 What aid and/or tools do the small-scale farmholders want and/or desire?.....	19
8. Analysis.....	19
8.1.1 How have global shocks affected the access to and use of fertilisers of small-scale farmholders?.....	20
8.1.2 How has the use of fertiliser changed?.....	22
8.2 What alternative strategies are they adopting in light of price increases?.....	23

8.3 Why are farmers having trouble accessing fertilisers despite the subsidy program?.....	24
9. Discussion.....	25
10. Conclusion.....	26
Reference list.....	28
Appendix 1.....	31

Acronyms

BMZ	Federal Ministry for Economic Cooperation and Development
BTI	Bertelsmann Transformation Index
CSO	Civil Society Organisation
DAP	Diammonium Phosphate
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GHI	Global Hunger Index
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
MAFC	Ministry of Agriculture, Food Security and Cooperatives
NBS	National Bureau of Statistics
NGO	Non Governmental Organisation
SAP	Structural Adjustment Program
SDG	Sustainable Development Goal
SFI	Sustainable Forest Investment
WTO	World Trade Organisation

1. Introduction

The main research problem that the study has investigated is the effects of the globalised system, specifically how it affects those far removed. While far removed can indicate economically, geographically, or culturally, this study will focus on those who are (mostly) far removed geographically, and to some extent economically. In the increasingly interconnected world, foreign events can drastically affect nations, governments and people. Historically, the largest downturns in annual GDP growth (world %) have been linked to drastic changes in oil prices (World Bank, 2021; Macrotrends, 2023). No matter how big the global shocks were, global growth had never been negative, until the 2008 financial crisis, and now also with COVID-19 in 2020. Global growth rates dropped from 4.4% in 2008 and 2.6% in 2020, down to -1.3% and -3.1% respectively the following year (World Bank, 2021). This shows that the modern global economy is far more connected and dependent on global stability, and in turn increasingly vulnerable to instability. This paper will focus on the effects of the two most recent global shocks, the COVID-19 pandemic and the Russian invasion of Ukraine.

In October of 2022, Europe had lost 70% of its ammonia production, creating a chain reaction resulting in Chinese export restrictions in order to maintain domestic availability (Baffes & Koh, 2023). Forecasts indicated a decline of 5% use of fertiliser globally, however, in Sub-Saharan there are fears it might decline by 25%, similar to the levels of 2010s (Hederbrand & Glauber, 2023). After COVID-19, and especially the Russian invasion of Ukraine, fertiliser prices have increased drastically. Since March 2020 (when the WHO officially declared COVID-19 a global pandemic), the three most used fertilisers have doubled in price, and even quadrupled during the early stages of the Russian invasion. The price of Urea¹ rose up to 172% of its 2020 price in the weeks after the invasion of Ukraine, until the government introduced a price cap and subsidies for Urea (Tanzania Invest, 2022). In Morogoro, Tanzania, the prices for DAP² and Urea increased by 128% and 32% from mid 2020 to March 2023 (TFRA, 2023).

Despite holding 25% of the world's arable land, Africa only produces 10% of the world's agricultural output (IFAD, 2017). Approximately 50% of Sub-Saharan Africa's workforce are

¹ UREA is a nitrogen based fertiliser, and the most commonly used.

² DAP is the worlds most commonly used phosphorus fertiliser.

engaged in agricultural production on the estimated 33 million smallholder farms, but the agricultural sector only accounts for just over 20% of GDP (IFAD, 2017; One Acre Fund, nd). Considering these statistics, it should not be necessary for African countries import over \$35,000,000,000 worth of foods (IFAD, 2017).

2. The Case

Tanzania is a country in Sub-Saharan Africa which is highly dependent on agriculture. According to a study from the Tanzanian National Bureau of Statistics, 65.3% of Tanzanian households were involved in agriculture (NBS, 2020). While the study does not specify the intensity of farming practices, whether as a livelihood or as something to do on the side, it shows the importance of agriculture for the country. During COVID-19 and the following plummet in global trade, fertiliser prices increased in Tanzania as a result of decreased international supply. Tanzania imports around 90% of its fertilisers, which shows its reliance on a functioning global market (Mtaki & Snyder, 2022).

Morogoro, the capital of the Morogoro District, is also the ‘agricultural capital’ of Tanzania. The city is almost completely surrounded by farms of various scales and houses the Sokoine University of Agriculture. Furthermore, Morogoro city is flanked by the Uluguru mountains to the south, which is where the majority of the fieldwork took place. The mountains are known for their steep slopes and above average rainfall, receiving up to 60% more precipitation than the upper average for the region. Morogoro has bimodal rain pattern, spanning from March-May and November-January respectively. The majority of precipitation comes during the March-May period, and is the most important for agricultural practices. Morogoro region has a moderate climate, with an average of 25c throughout the year.

For the study, Morogoro region was chosen as it is the country’s ‘breadbasket’, and large investments (such as the subsidised fertiliser programs) are being made to increase the region’s agricultural output (Kalumbia, 2023). Additionally, Morogoro was chosen as 488,000 farmers are eligible to receive subsidised fertilisers, but only 142,000 have (as of february 2023) registered to the scheme (ibid). The fertiliser subsidy program requires farmers to register at

specific registration stations, when registered, they gain access to subsidised fertiliser through the government program.

3. Research Questions and Aim

The aim of the study was to understand not only how global shocks, specifically COVID-19 and the war in Ukraine, affected farmers, but also how the context of the farmers may aggravate or ameliorate their situation and the severity of the effects. Through semi structured interviews, the study attempts to understand the personal experiences of the farmholders affected, and how they tackle the problems presented by the two global shocks focused on in this paper. There are two main research questions at the centre of the fieldwork, in addition to the two main questions, a third question was added during the duration of the fieldwork.

- How have global shocks affected the access to and use of fertilisers of small-scale farmholders?
- What alternative strategies are they adopting in light of price increases?
 - Why are farmers having trouble accessing fertilisers despite the subsidy program?

To summarise, the paper focuses on how the macro, that being the global system, affects the micro, being the small-scale farmholders in rural Tanzania.

4. Previous Studies

Searches using keywords such as: Fertilisers, COVID-19, Russia, Ukraine; did not result in any academic literature on the subject topic of this paper. There are however a plethora of *reports* from various organisations and companies, such as the World Economic Forum (2023), International Food Policy Research Institute (2023) and the Food and Agriculture Organisation (FAO) (2022), yet these focus on statistics rather than impact. A unusually low amount of research is being focused on the grassroots effect of the global shocks over the past few years. The lack of academic research and literature on the subject becomes even more surprising when

considering that African countries make up 11/13 with the lowest food security globally, with the only two exceptions being the war torn Yemen and Syria Arab Republic (Global Hunger Index, 2022). Increasingly worrying, is that only two African countries are classified to have a low hunger index (Global Hunger Index, 2022). These statistics, coupled with the SDGs 2030 agenda makes it even more perplexing as to why there has not been more effort and focus put into understanding and mitigating the effects of global shocks on the estimated 33 million smallholder farms in Africa, whom produce up to 70% of the food supply (IFAD, 2017).

4.1 COVID-19 and Fertiliser

The only academic paper found regarding fertiliser prices after COVID-19 is '*Influence of COVID-19 pandemic on fertilizer companies: The role of competitive advantages*', which focuses on fertiliser companies, and not small scale farmholders (Ilinova, Dmitrieva, Kraslawksi, 2021). Although the study focuses on how competitive advantages among fertiliser production companies affected them during COVID-19, it is important to this study as Tanzania imports around 90% of its fertilisers (Mtaki & Snyder, 2022). Studying how macroeconomic aspect of fertiliser trade is affected by shocks, may highlight important factors in mitigating the effects further down the value chain.

4.2 Global Effects on Commodity Prices

The IMF report by the IMF's Strategy, Policy, and Review Department, *Managing Global Growth Risks and Commodity Price Shocks Vulnerabilities and Policy Challenges for Low-Income Countries* (2012) focuses on how global growth affects commodity prices. The report, however, focuses on the price shock itself, not on how it affects those exposed to it. Saccone (2021) writes about how COVID-19 has affected the world's aim of reaching the SDG goal nr 2.1, being the hunger goal. The paper discusses how economic growth has been an overall indicator for general health and food security, based on data from 2000-2017. The author, however, focuses on the world and macro-aspect and does so from a health & economy perspective. The report focuses on effects of COVID-19 on hunger, which is inherently linked to agriculture, nonetheless it is a relevant article for this study.

4.3 Fertiliser Prices & Hunger

A joint report from 2022 by the Food and Agriculture Organisation (FAO) and the World Trade Organisation (WTO) studied the effects on fertiliser prices, and in turn the increase in chronic hunger, over the last years. The report focuses mostly on the macro aspects of fertiliser prices and availability, it does, however, show parts of the chain reaction that COVID-19 and the war in Ukraine created, and how it affects African countries. Additionally, the report provides plenty of propositions to mitigate future impacts of the current spike in fertiliser prices. It unfortunately, shows all possible ‘solutions’ on a macro scale, and as this paper will show, many of the problems caused by price spikes can be mitigated internally. This is not to say that all issues related to increased agricultural input costs can be solved internally, rather that focusing on the issue through the macro political economy lens that the FAO and WTO use may not be practical. The report does not include micro-level mitigation strategies for price spikes regarding fertiliser, nevertheless, the report proposes a handful of macro solutions that international governments can adhere to to mitigate the inflated agricultural input prices.

5. Methodology & Empirical Material

This chapter will focus on the practical aspects of the research, such as research design, sampling and accessing participants, conducting the interviews, and reflecting upon using a translator, ethical considerations, and their role in shaping the study.

5.1 Research Design

The data was collected through intrinsic qualitative design and semi-structured interviews. Qualitative studies aim to view ‘subjects’ in their most natural setting, and “[...] capture data on the perceptions of local actors 'from the inside' [...]" (Punch, 1998; 149). A feminist approach to interviews was used as it aims to create an even atmosphere, without biases and power relations (see section 4.4 ethical considerations). This type of research was chosen as suitable for the proposed study as it aims to capture the perception of small-scale farmholders and how they have

experienced the last three years of global shocks. A case study “aids to understand the case in-depth, and in its natural setting, recognizing its complexity and its context” (Punch, 1998; 144).

The flexible design was appropriate as the research questions evolved during the period of the study, to better focus and adapt to relevant themes that appeared, such as the social and cultural context. During the interviews it became clear that a large proportion of the effects of the global shocks (COVID-19 and the Russia-Ukraine war) could have been mitigated if there was a more effective distribution system put in place by the government.

All the material collected during fieldwork was through open and semi-structured interviews. Semi-structured interviews are key in qualitative feminist research as they allow the interviewee to participate in guiding the focus of the interview and making their opinions heard (Punch, 1998). Semi-structured interviews are based on the interview guide but allow for follow up questions depending on the responses by interviewees. A key aspect is to let the interviewee lead the interview and be allowed to answer freely (Robson & McCartan, 2016). To allow the interview to have a natural flow, and to allow the interviewee to fully be able to express their experiences, it is important to listen more than you speak. Furthermore, Robson & McCartan (2016) emphasise the importance of ‘enjoying it’ and ‘at least look as though you do’, which will entice the interviewee to continue to speak freely and openly (Robson & McCartan, 2016; 287)

5.2 Conducting Data Collection

5.2.1 Host Organisation

The host organisation, Agriwezesha, is an agriculturally focused NGO in Morogoro. Agriwezesha works with small scale farmholders in a variety of ways, they work with over 3,000 small scale farmholders in 32 different villages in and around Morogoro region. Their work includes, but is not limited to, planting trees to ‘reverse’ deforestation, building tree nurseries, knowledge and micro loans.

'We have three types of projects, one is farmers financing, another is based on environmental conservation as well as ecological farming, where we do tree planting. The last one is womens' empowerment, some projects have more than one aspect, other than farmer financing, which is specifically focused on that' (Deograsia Ignas, Director of Agriwezesha).

5.2.2 Sampling & Accessing Participants

Agriwezesha aided in accessing research participants, and highlighting the most pressing issues they faced as an NGO. Additionally, when designing the interview guide, Agriwezesha helped avoid any possible culture clashes, increasing the ethical aspect of the research. Agriwezesha did not change any lines of questioning, entailing that the interview guide was qualified. Nonetheless, it increases the ethics and credibility of the research.

All interviews were conducted after farmholder meetings with Agriwezesha, as many farmers had 'taken the day off' from working their land to attend the meeting. This was in order to interview the farmholders when they were free, and in doing so not interrupt their daily activities. The study did not follow 'max variation' sampling, but did aim to find farmholders with various perspectives, such as area and crops cultivated, fertiliser use and time spent farming. There was no preference between men and women, age, nor the type of farm or area cultivated, the only prerequisite was that the farmholders needed to use fertilisers.

5.2.3 Conducting the Interviews

The research participants were asked fifteen different questions relating to their use of fertilisers, their access to fertilisers, and background information of their agricultural production. Some participants answered multiple questions at the same time, and were therefore not asked those questions a second time. All questions were formulated to be as value free as possible, to not lead the participant to a certain answer with the question. Meaning that, for example, question 9 'How has the access [to fertiliser] changed?', which is a leading question, is preceded by question 8 'Have there been any changes to fertiliser access?', which is an open ended question.

All participants were asked the same base questions, although some differing follow-up questions, as the interviews were semi-structured. The majority of follow-up questions were related to answers to questions 12, 14 and 15. Moreover, all participants were made aware that

they could cancel the interview at any time and withdraw from it altogether at a later time if they so wished. The research participants were also made aware that the data gathered during the fieldwork will not be shared, that only the analysis of the results and conclusions would be shared. All interviews were completely voluntary and anonymous as well. Additionally, no farmholders were asked if they wished to participate in the research when they were working, as the research did not wish to take/demand their time.

5.2.1 Translator

All interviews were conducted with the help of translators, as the language spoken in Morogoro is Kiswahili. Three different translators were used during the fieldwork. Two who were employed by Agriwezesha, and one that was not. All three translators were familiar with local customs, have an academic background in different agricultural studies, and have Kiswahili as their mother tongue. Great emphasis was placed on the importance of transparency between the researcher and the translator during the interviews, and that all participant answers should be directly translated, without adding or removing any parts. Before working with the translators, individual meetings with each one of them were held, in order to convey what the research hoped to accomplish and what was expected of them. Having three different translators was possibly beneficial to the research. Benefits of having three different translators could include different knowledge of certain areas in which interviews were conducted as well as relations with the local population in said areas.

5.3 Data Analysis.

Huberman's (1994) *Qualitative Data Analysis* is one of the tools used to analyse the data gathered during the fieldwork. It helps code and understand the data which has been collected, and hopefully also make it more easily comprehensible. Inductive thematic coding was used in order to not bring any preconceived notions into the coding of the data (Robson & McCartan, 2016). The data led the coding and themes were identified as the coding progressed.

The material is used to build a knowledge base and to give background information regarding the research. The data will be analysed through PESTEL, which will be presented in depth in chapter 6. When the data has been analysed and understood, the results will be presented and discussed with the aim to hopefully contribute with meaningful knowledge.

5.4 Ethical considerations

Bryman (2012, 138) outlines four main themes of ethical transgression: harm to participants; lack of informed consent; invasion of privacy; and deception. These were avoided by ensuring that the participants were fully aware of the use of the research, that their consent was given (verbally, as literacy rates are low in rural Morogoro), that the records were anonymised, and that there was no information that was withheld from the participants. Further, as aforementioned, the participants were made aware of their right to withdraw from the interview at any time, or revoke their responses.

Prior to the fieldwork, Punch's (1998) ethical guidelines to doing research were reviewed, as well as Chambers's (1981) biases and how they affect research. The most relevant biases for this fieldwork were: *Spatial bias* (not leaving urban or semi-rural areas, and therefore not accessing the most rural); *Project bias* (travelling to areas where plenty of previous projects and studies have been conducted); *Male bias* (which has two aspects to it, only interviewing males, and that men and women interviewers may receive different answers), and lastly; *Elite bias* (interviewing those easiest to access, not attempting to interview those who are in the 'background') (Chambers, 1981). In order to reduce the risk of the aforementioned biases, farmholders in different areas and genders were interviewed, and the majority of the study was conducted in rural areas. Chambers's (1981) biases created the base for how the study attempted to minimise any negative impact that preconceived ideas and thoughts may have on the research.

Additionally, during preparation for the fieldwork, Scheyvens (2014) was studied in order to build a theoretical background that would guide the fieldwork and make it as value free and ethical as possible. Positionality and power relations are inherently present in all interactions, consciously or not. In the case of researcher and the researched, uneven power relations are

detrimental to the ethics in the research process. Good research is done by navigating the positionality and understanding reflexivity as a foreign researcher (Sultana, 2007). Sultana claims that, which can be seen to link to Chamber's (1981) biases, positionality always affects fieldwork, regardless of if the researcher is aware of it or not. As a white male researcher from the global north, I am aware that my positionality affects the research process and interactions. To be respectful and minimise power relations, in terms of language and cultural differences, I attempted to acclimate to the cultural setting, by dressing appropriately and learning the mannerisms. Additionally, Sultana (2007) presents several key aspects of interviews that were employed to reduce power relations, such as 'vertical hierarchy' (when the researcher sits or stands above the participant). During the interviews in Morogoro, it was always made sure the interviewee always sat on a higher stool, chair or bench.

Critical views on fieldwork and research, such as Spivak's (1988) were studied and consulted during the development of the interview guide and planning of the fieldwork. Spivak is especially critical of 'Westerners' doing research outside their country, or not regarding 'their own' country. Entering an already set social setting entails that the study must be seen as a "[...] a world that is already interpreted by people who are living their lives in it" (England, 1994, 87).

Kapoor (2004) continues by quoting Alcoff (1991) "Though the speaker may be trying to materially improve the situation of some lesser-privileged group, the effects of her discourse is to reinforce racist, imperialist conceptions and perhaps also to further silence the lesser-privileged group's own ability to speak and be heard" (Alcoff, 1991, cited in Kapoor, 2004; 631). Thus, the researcher has situated himself as such, as "[...] speaking from a point of privilege, helps to avoid the unintentional marginalisation of other groups or identities [...]" (King, 2017, 64).

5.5 Strengths & Limitations

The main strengths of the data collected during fieldwork is its credibility and its relevance to the main research questions, but also relevance in the sense that it is recently acquired data. Credibility means that the data is straight from those who the research concerns, relevance means that the participants experience the effects of the research question, and lastly newness means that not only is the data gathered recently, but also that the phenomenon which is being studied is

relatively new as well. The authenticity of the study, according to Punch (1998), is strengthened by its originality within the discourse.

Although the aim of the thesis has not changed greatly, considerable focus (by the research participants) was put on how the government programs (put in place to help them mitigate potential losses due to fertiliser price increases), were a positive initiative but poorly executed and therefore not very helpful in practice. In this sense, the focus during the fieldwork was slightly more on the national-local level rather than the international-national-local level. As the research participants put great emphasis on the shortcomings of the government programs' implementation, it would have been unethical to solely focus on the international and local aspect of the issue. Therefore, an increased focus on the national aspect was integrated into the interviews, and will be included in this paper.

Despite the previously mentioned possible positive aspect of having three different translators, there are of course limitations associated with having several translators with different areas of expertise. First of all, it made it difficult to get to know the translators and understand their translation methodology, which could have resulted in skewed data. Secondly, different backgrounds within agriculture could make them more inclined to emphasise certain aspects of the answers received during interviews, thus potentially providing different translations for the 'same' answers. Thirdly, it lowers the consistency of the research, as it is not as uniform. There are of course some aspects that can be both negative and positive such as that the translators could have and receive different biases to and from the local population/research participants. Additionally, different preferences for whom to interview, and level of translation expertise could be affected. Although none of the translators appeared to exhibit any of the aforementioned detrimental biased characteristics, it can not be known as the language of communication with the translator was English, and translation occurred between Kiswahili and English. Although it is unlikely that the research was negatively affected by the use of multiple translators, it is important to note.

The most challenging aspect of conducting the interviews was gaining access to participants. Time constraints, such as travel time or necessity to attend their farms may have inhibited participation by otherwise willing participants. Access to research participants was gained through Agriwezsha, and although there were assurances that all research participants

participated voluntarily, it can never be 100% confirmed. There were some difficulties finding willing participants, which would entail that those who did participate did so willingly, and not under any misguided pressure from the organisation. Regardless of participants' level of voluntary participation, not knowing for certain does make the study less ethical.

The most challenging aspect ethically, although not always present, was successfully communicating to some research participants that the study was for a Bachelor's thesis, and not for an organisation to help them. At the end of the interviews, the participants were always asked if they had any questions or considerations. This was meant to be in regard to the research and/or material. However, some participants seemed to understand it to be 'ask anything whatsoever'. Unfortunately, this, in turn, led to around 40% of the participants asking how the research was going to help them; some asked if certain items, such as large water pumps and other agricultural equipment could be sponsored. This may have been due to our acquaintance with Agriwezsha, from whom they were beneficiaries. Positionality in this sense was mostly only an issue when the research was misinterpreted to be for someone or something with a lot more influence and 'power'. Most of the time this was not an issue, however, and sometimes the interviews seemed to tense up, just a bit, when research participants understood the narrower scope of the study. To prevent this, further emphasis and time was put on explaining the scope of the project, and the limited real time benefit for the participants. However, it is a situation that should have been avoided, through different and improved communication/translation when presenting the reasoning and aim of the fieldwork.

There are however some limitations, not necessarily to the credibility or relevance of the material, but to the amount of data collected. A substantial amount of more data could have been gathered, if there was a faster immersion to the culture and surrounding area of Morogoro, and a longer period of time to conduct the data collection.

6. Analytical Context

A context analysis will be presented in order to give a solid overview of Morogoro District. The PESTEL analysis will be used to identify important contextual factors. The acronym PESTEL

stands for *Political, Economic, Social [Socio-cultural], Technological, Environmental and Legal* (EC, nd). Although all six are theoretically equally important, the focus will be on political, economic, social and environmental factors. Each of these four will be used to provide the foundation from which the analysis will be based on. All contextual analysis will be focused on Morogoro region, unless stated otherwise.

6.1 Political Context

According to the Federal Ministry for Economic Cooperation and Development of Germany, Tanzania is one of the most politically stable countries in East Africa. However, the country has been moving towards a more authoritarian political system, although the early signs of the current president Samia Hassan look positive for open democracy (BTI, 2022). The Ministry of Agriculture Food Security and Cooperatives (MAFC) 2013 ‘National Agriculture Policy’ has been implementing policies to change the direction of Tanzanian agriculture (MAFC, 2013). The policy document states that their vision is “An agricultural sector that is modernised, commercial, highly productive and profitable; that utilises natural resources in an overall sustainable manner in Eastern and Central Africa that acts as an effective basis for inter-sectoral linkages by the year 2025” (MAFC, 2013; 9). The mission and general objective of this policy is to transform the agricultural sector into a modern, commercialised and profitable sector, that improves livelihoods and leads to poverty alleviation (MAFC, 2013;9). The government has been allowing large areas of land to be bought by corporations in order to produce sisal, a plant whose leaf fibres are used to make products such as ropes and mats (WITS, nd). Despite creating jobs farming, harvesting and refining sisal, the sisal farms use thousands of acres of prime agricultural land, and therefore demoting small-scale farmholders to poorer land. Due to the macro financial gain, an estimated 12,000 hectares of flat, fertile, and easily accessible land is used for sisal production (Sisal Estates, nd). The 12,000 hectares lay within 65km of Morogoro, along the main road between Dar es Salaam and the capital Dodoma. Purchasing land in Tanzania can better be described as leasing the land from the government, as the country has a ‘de facto possession’ regulation. This regulation allows the government to repossess land if it is not being used efficiently, or correctly (WITS, 2013). One foreign-owned sisal farm was only using one fifth of their 6,900 hectares ‘leased’ land near Morogoro. Despite local farmholders

complaining to government officials that the land has been ‘occupied’ for over a decade, there has been no repossession of the unused land (WITS, 2019). During a visit to the area, the Tanzanian finance Minister instead praised the owners’s field management, and stated that any repossession of land would scare off future investors. Despite land possession laws implemented to protect local farmholders from land grabbing like this, it is clear that they are not prioritised.

6.2 Economic Context

Agriculture dominates Morogoro region’s economic activity, engaging roughly 80-90% of the labour force. The agricultural sector generates 67% of the region's GDP, with industry & construction and services accounting for roughly 16% each. A large share of the economic agricultural output can be attributed to sisal, which was introduced by the Germans in 1893 when Tanzania was a German colony (SFI Tanzania, nd). During the 1960s, Tanzania was the largest exporter of sisal in the world, and all sisal factories were nationalised after the independence from the British in 1961. In 1997, after a decline in popularity in favour of synthetic nylon, sisal factories were once again privatised (SFI, Tanzania, nd). By 1997/9198, compared to 1996/1997, the agricultural share of GDP had dropped from 42.6% to 26.5%, despite widespread drought in 1996/1997, and favourable rains 1997/1998 (FAO, 1998; World Bank, 2021). The region also extracts various minerals, however it is not comparable to the agricultural sector. Additionally, crop sales are the main source of income for 60% of the population (NBS, 2022). During the 1980s and 1990s the structural adjustment programs (SAPs) were implemented in Tanzania. A key component was trade liberalisation, opening the Tanzanian market to the rest of the world. Although this would theoretically open foreign markets to farmholders, it did more harm than good, as small-scale farmholders faced increasing competition from foreign actors with competitive advantages (IMF, 2001). Along with the liberalisation of trade, government subsidies were removed, as the SAPs followed a ‘hands off’ approach. Once again small-scale farmholders were the most impacted, as they to a much greater degree relied on government support to overcome challenging economic circumstances.

6.3 Social/cultural Context

Morogoro is dominated by five ethnic groups, the Progoro, Luguru, Ndamba, Sukuma and Ngindo, with many more less common found in the region (NBS, 2020). It is one of the fastest growing regions in Tanzania, with many people migrating due to the favourable soils and grazing land. Approximately 30% of the population of 2.7 million live in urban areas, with the rest living in rural areas. In 2012 (which is the latest population consensus) persons aged 0-14 made up 41.3 percent of the region's population, with those above 15 considered to be of working age (NBS, 2022). Literacy rates vary vastly, with rates in urban areas almost reaching 90%, while in rural areas it is around 65%, although both figures are increasing year by year. Tanzania is dominated by patriarchal structures, which is also seen in land inheritance norms. Land is owned by the male head of the household, and when he passes away, his sons inherit the land. Women can acquire their own land, through the 'village government'. This however would require them to clear 'virgin land', which is usually past all 'occupied' land nearby (van Vuuren, 2000). Women are traditionally responsible for household duties, but are also expected to work the cultivable land along with the men. Having several time consuming activities decreases their accessibility to e.g. agricultural inputs.

6.4 Environmental Context

Morogoro lies approximately four hours due west of the largest city in Tanzania, Dar es Salaam, on the way to the capital Dodoma. The area surrounding Morogoro city is flat, with the exception of the Uluguru mountain range. Morogoro experiences two rain seasons, one which starts in November and ends in January, and one which starts in March and ends in May. Due to the seasonal nature of precipitation, rainfall, specifically during January, March and April, is extremely heavy and causes substantial erosion. Due to the topography of the Uluguru mountains, there are significant variations in precipitation compared to the average across Morogoro. The majority of agriculture is dependent on rainfall, with irrigation inputs being too expensive or inaccessible for small-scale farmholders. The mountains, in which many small-scale farmholders live, have poor infrastructure and are almost exclusively accessible by motorcycles and 4x4 vehicles. Most areas do not have paved roads and are therefore heavily

impacted by the rains, as they wash large amounts of rock and debris onto the roads, while also eroding them (NBS, 2022). The flatlands of Morogoro consist mainly of alluvial soil, which is highly fertile, while the mountains consist of oxisols, which are poor in nitrogen and phosphorus, both of which are necessary for cultivation (NBS, 2022). The lack of easily accessible farms surrounding Morogoro means that many small-scale farmholders cannot easily access transport or markets to sell their produce. Additionally, it means that many farmers are forced up the mountainsides, where soils are meagre. Soil depletion has been an escalating issue for many years, as most of the farmholders do not have enough land to fallow it and therefore require fertilisers as they exhaust it through constant use (van Vuuren, 2000). Lastly, the key informant stated that farmholders were expanding up the mountainsides, causing mass deforestation and environmental destruction. Deforestation has many implications for cultivation, trees hold the soil together, preventing erosion, they hold water and create shade, which reduces evaporation and the temperature to name a few.

Subsidy

7. Results

The following chapter consists of four sections. Each section presents data from the study regarding a question related to the study, and focuses on the broader results of the study. The more intricate data will be supplied in the analysis. The topics for the sections are Section 1: Has fertiliser use among small-scale farmholders been affected since the outbreak of COVID-19 and the war in Ukraine?; Section 2: Do small-scale farmers have alternative strategies, in light of fertiliser price increases?; Section 3: Are farmers having trouble accessing fertilisers despite the subsidy program?; and lastly Section 4: What aid and/or tools do the small-scale farmholders want and/or need? The data will be discussed and analysed in depth in the next chapter.

7.1 Has fertiliser use among small-scale farmholders been affected since the outbreak of COVID-19 and the war in Ukraine?

Questions 8 and 9 were often answered as one, as those participants first answered that there have been changes to the fertiliser access, and continued by explaining how. Eight out of ten participants reported that their fertiliser use had been negatively affected since the COVID-19 outbreak. Out of these eight, seven attributed the decrease in fertiliser usage to the increased price of fertiliser, while five of the seven also included lack of access as a central issue. Out of the two respondents that answered that their fertiliser usage had not changed markedly since the COVID-19 outbreak, one said that the increased price was an issue, but that it was a non-negotiable expense. Five out of ten respondents reported that the area on which they apply fertiliser has not changed, though they apply significantly less fertiliser. All respondents indicated that fertilisers are unquestionably the most important input (other than the seeds they buy). Nine out of ten respondents said that without fertilisers, their yields would risk being negligible, while the tenth respondent indicated that although the yield would be reduced without applying fertilisers, it would only be marginal. Additionally, three farmholders stated that they were increasingly reluctant to apply fertilisers to their farms. The farms of these three are located on mountain slopes and are susceptible to soil erosion. Irregular rains (such as those during the fieldwork) can therefore wash away large proportions of the applied fertilisers and essentially nullify the positive effects of fertiliser.

7.2 Do small-scale farmholders have alternative strategies, in light of fertiliser price increases?

Questions 10 and 11 were also often answered in one, as those participants first explained what animals they had, and went on to explain how they use the manure in combination with fertilisers. Eight out of ten participants have alternatives to fertilisers. Out of the eight, five have direct access to manure, from animals that they own; the other three could borrow and/or buy manure from their neighbours. Additionally, one of the three that did not have animals, but had a functioning compost that they could use as organic fertiliser. All the farmers that owned animals

were asked why they did not build a compost, to which the answer was that they fed their animals with leftover agricultural waste. The two farmers that did not have access to alternatives to fertilisers clarified that it was due to lack of resources and time. When asked about the possibility of creating a compost for organic fertiliser, the two farmers answered that they could not build a compost due to the risk of attracting rats. Despite the majority of participants having access to alternative sources of nutrients for their crops, all (but one) reiterated that fertilisers were an absolute necessity for adequate yields. Other than the alternatives for fertilisers, there were no other adaptation strategies. That is not to say that there were no hopes or plans regarding adaptation, simply that they were not possible. The hopes and plans of adaptation strategies will be presented in section 7.4.

7.3 Are farmers having trouble accessing fertiliser despite the subsidy program?

Despite the subsidies program, only two farmers had registered for the fertilizer subsidy program. Four did not know that the program existed, and the remaining four were aware of the program but could not access the subsidised fertilisers. The main reason that the subsidised fertilisers were inaccessible was the long distance to the stations to register for the subsidies program. All the registration stations were down near Morogoro, and it was not feasible to travel down the mountains from their farms to register. There was a bus line to one of the villages where farmholders were interviewed. This bus, however, is costly and takes a long time to reach the nearest village with connecting buses to larger villages and Morogoro. This means that theoretically only three of the participating farmholders can travel to registration stations. The remaining farmholders did not have access to registration stations due to lack of roads suitable for four wheeled transport. Even if the remaining farmholders could access the subsidised fertilisers, it would require multiple trips with a motorbike transport, as it is recommended to use 4 x 20kg bags per acre cultivated. Out of the two farmers that had registered to the fertiliser subsidies program, only one was able to benefit from it, as they lived very near Morogoro, along the main road to the city. The farmer that had registered, but not benefited from the program, had travelled to the subsidies station, but the station had run out of fertiliser.

7.4 What aid and/or tools do the small-scale farmholders want and/or desire?

The most common aid that the farmholders wished for was increased presence of agro-dealers, also known as agricultural extension workers. Four participants stated that an increased presence of agro-dealers would increase their access to subsidised fertilisers, general agricultural inputs such as seed varieties, and knowledge. Currently, the three farmholders stated that they knew that there should be an agro-dealer in their area, but that they were not sure if there was, or that the agro-dealer was inaccessible. Two participants said that improved access to agro-inputs was necessary, while two more wanted increased spread of knowledge regarding private ‘manufacturing’ of organic fertilisers. The remaining two participants wanted improved seed varieties that could grow with less fertiliser, whilst also being more drought-resistant, and reduced fertiliser prices. How the proposed improvements can be achieved will be discussed in the analysis chapter.

8. Analysis

In this chapter the empirical material collected during the fieldwork is analysed and discussed. The two main research questions will lead the analysis, and interview quotes and relevant literature will be used to strengthen the validity of the findings. To maintain anonymity, the research participants, when quoted, are assigned a number from 1-10, in the order that they are quoted. As this paper is not built on one single theory, the analytical context will take the place of traditional theory, and help interpret the results. The research question is split in two, with the

first section focusing on the access to fertilisers, and the second focusing on how the use of fertilisers has changed. A presentation of the overall findings of each research question, is followed by analysis based on the context and strengthened with direct quotes.

8.1.1 How have global shocks affected the access to and use of fertilisers of small-scale farmholders?

As shown in the results section, all the participating farmholders have had their access to, and use of fertiliser recently affected. While not all participants experienced a negative impact regarding fertilisers, the overwhelming majority did.

Eight out of ten participants had experienced negative impacts on fertiliser access and use. All but one of these eight live in the mountainous areas near Morogoro. A study from 2021, ‘The geography of agricultural input markets in rural Tanzania’ by Rutsaert et al, focused on the role and accessibility of agro-dealers in remote areas (Rutsaert et al, 2021). The study focuses on several regions in Tanzania, the region relevant to this paper is Mufundi, as it is a neighbouring region to Morogoro, with similar, although less varying, terrain (Rutsaert et al, 2021). The average travel time between agro-dealer and farmholder was 97 minutes in Mufundi, while the average across the study was 60 minutes. Farmholder 1 has to walk up the mountain ‘a few’ kilometres to access her farm, increasing the necessity for agro-dealers to be easily accessible due to the added time and energy required to access her farm..

Translator: ‘The government needs to increase agro-dealers from town to the village, and improve the accessibility and availability of fertilisers’. (Farmholder 1).

The liberalisation of Tanzania's economy has been ongoing since the SAPs, with government employees in key sectors (in Morogoro) being reduced by almost 40% from 2016-2020. The agricultural sector however, has only lost roughly 15%, showing its importance in Morogoro (NBS, 2022). The agro-dealer/farmer ratio in the neighbouring Mufindi region was 1/2919,

which was the highest in the study. The average agro-dealer/farmer ration in the study was 1/1619, suggesting that the government's agricultural budget increase of roughly 200% is focused on large scale exports, and not small-scale farmholders (Anyango, 2022; Rutsaert et al, 2021). Agro-dealers in areas where they faced little to no competition, in remote areas especially, were known to increase their prices, leading to a minimised price reduction for farmholders, despite the subsidies (Rutsaert, 2021).

The export-oriented agricultural policies, regarding large scale plantations mentioned in the political section of context analysis further demotes farmers. Occupying large areas of flat, fertile lands has demoted farmholders to hilly regions, where the soil has less nutrients (NBS, 2022). With the heavy rains washing away the topsoil of the already nutrient-poor soil, fertilisers are essential. Farmholders 1, 2, 3 and 4 all stated that their yield is completely dependent on the application of fertilisers.

Translator: 'If they do not apply fertiliser they will not harvest' (Farmholder 2).

A common theme among the farmholders living and cultivating along steep mountain sides was the challenge of accessing, and transporting the fertiliser back to the farm, due to the long distance and poor infrastructure.

Translator: 'It is difficult to access fertiliser for two reasons, first of all supply is still low, and in their [farmholder 1] location it is difficult to transport fertiliser from town to here' (Farmholder 2).

Translator: 'Accessing fertiliser has always been a challenge, but now with the price it is expensive to travel and purchase, and transport it to our residence'. (Farmholder 3).

Studies show how remoteness and isolation have negative effects on agricultural productivity and poverty (Stifel & Minten, 2008). Tanzania lacks widespread modern infrastructure, with most major cities having a core of paved roads, but successively transitioning to dirt further from the city. The importance of easy access to markets, towns and inputs is portrayed by farmholder 5. She lives near the main road from Dar es Salaam to Morogoro, and is the only farmholder that

did not report that her yield would drastically decrease without fertilisers. Additionally she stated that she has contact with agro dealers. When asked what she cultivates, she answered

‘Sometimes I do change, for example if we hear of new crops which will be for benefits, be beneficial for us, then we change. Such vegetables, for example [...] [I hear from] from different companies, sometimes they call us and teach us how they plant their seeds, so they invite us to buy and go plant.’ (farmholder 5).

Her location allows easy access to inputs and information. It also reduces her reliance on fertilisers, as the soil in the flatlands is far more fertile than that of the mountains. Furthermore, since her farm is located on flat ground, she keeps several cows and pigs, which enable her to add large amounts of manure instead of fertiliser.

8.1.2 How has the use of fertiliser changed?

Fertiliser use in Tanzania is remarkably low, with only 15% of farmholders applying fertilisers to their crops (Chamberlain & Palmas, 2020). Further changes in application of fertilisers would exponentially decrease productivity and food security, as an average of 17kg of nutrients per hectare of cropland, in Africa, is applied, compared to the world average of 135kg (Harrison, 2020).

Five of the farmholders have experienced a decrease in fertiliser use, due to price increases and lacking availability. A common theme throughout the fieldwork was that many farmers have drastically reduced the amount of fertiliser they apply to their crops.

Translator: ‘they have been affected by availability and they reduce the amount of fertiliser. Instead of 20kg for certain area, they use 5kg’ (Farmholder 2).

One of the most common adaptations to the increased fertiliser prices and decreased availability was actively not cultivating the entire plot. The naturally nutrient-poor soils have been exhausted to the point where it is not sensible to cultivate without fertilisers. Farmholder 6 owns a total of three acres that he has cultivated in the past, but with the fertiliser issues he cannot cultivate all three acres.

Translator: 'He owns three acres but can only apply fertiliser to two acres, he uses one for maize, and one for rice. No more' (Farmholder 6).

The situation is not as grim for all small-scale farmholders, as exemplified by farmholder 5, who can substitute fertiliser for manure without her yield shrinking.

'Sometimes 1 ½ acres, sometimes two, I only apply fertiliser to one acre' (Farmholder 5).

Thus, the oxisols of the mountains put the farmers at a natural disadvantage as they cannot cultivate without additional inputs that require time and money to acquire. Due to the political nature of land tenure, farmholders are forced to move to less productive areas that are not suitable for farming.

8.2 What alternative strategies are they adopting in light of price increases?

The vast majority of adaptation strategies for farmers in Tanzania are related to climate change. To summarise the current alternative strategies of the ten farmerholders; they use less fertiliser per acre, they do not cultivate their entire plot, and they use manure instead of fertiliser. Studies such as the one by Volk et al (2021) mention the role of fertiliser adaptation, however it only does so in relation to increasingly unpredictable climate variations (Volk et al, 2021). All the alternative strategies that participating farmholders presented have already been brought to light and discussed. All these strategies can be seen as mitigation strategies, as they are preferable over decimating the harvest. Some farmholders had ideas regarding adaptation strategies that were not related to fertilisers, but would have positive effects on the yield. Farmholders 2 & 3 wanted to build water harvesting structures, in the form of trenches running horizontally across the top of their plots. They had been informed that water harvesting structures were a reliable time investment. In their case that would be true, as they live along steep mountain sides and a lot of rain water runs off, before soaking into the ground, additionally it would reduce topsoil erosion on their plots, as the trench catches the water (Volk et al, 2021).

Translator: 'Almost all of it, big challenge is the hilly terrain. The fertiliser runs off when it rains a lot' (Farmholder 3).

Neither of the two farmholders had the means to undertake such a project, as they did not have the time nor the financial means or expertise to do so. Volk et al's study showed that without sufficient fertiliser, stable access to water for the plants is crucial (Volk et al, 2021). Farmholders 2 and 3 could therefore theoretically mitigate some of the effects of insufficient fertiliser application through their proposed water harvesting structures. The prospect of building water harvesting structures seems to increase with vicinity to urban areas. Farmholder 5, who lives very near Morogoro along the main road, was able to build a water tank, to irrigate her crops during dry spells.

The lack of adaptation strategies for the unavailability of fertilisers can be attributed to the preference for macro farming seen in government policies. When unveiling the budget for 2002/2023, minister of finance and planning, Mwigulu Nchemba, discussed increasing value of exports

'The government intends to increase sales of horticulture produce from 750 million U.S. dollars per annum to 2 Billion U.S. dollars per annum by 2030' (Mwigulu Nchemba, 2022).

The large-scale farms, which the government prioritises, have the funds and means to access fertilisers regardless of price fluctuations. Moreover the ground which they cultivate is naturally more fertile, and holds the water, as it soaks into the flat ground. The SAPs reduced government influence on the economy, as well as reduced and/or removed aid programs aimed at small-scale farmholders, which in turned further exposed them to shocks.

8.3 Why are farmers having trouble accessing fertilisers despite the subsidy program?

The reduction in government spending on small-scale agriculture and aid related to it, such as with the implementation of the SAPs, has impacted the reach of current agricultural policies. Small-scale farmholders in remote regions do not benefit from subsidised fertilisers as they have to travel far to access them.

Translator: 'Everybody needs fertilisers, but the problem is they are far. I cannot get cheap fertiliser, even the expensive has low availability' (Farmholder 7).

The environment in which they live makes travel difficult, as the infrastructure is generally very poor, until the main roads are reached. Through personal communication during the field study, it was implied that not all subsidised fertilisers were sold at a reduced cost, as

agro dealers could increase the price due to the scarcity and high demand of fertilisers. There are two root causes of this, both related to government policies and planning. Since the SAPs, and Tanzania's shift export oriented macroeconomic policy, small-scale farmholders have been the 'second tier' of agricultural development. The favouring of large-scale farming operations, such as the sisal plantations in Morogoro, has demoted small-scale subsistence farmers to areas with inherently poor access and infrastructure. Moreover, the constant reduction of key government personnel employed within agriculture adds to Tanzania's inability to implement a well-functioning fertiliser subsidies program (NBS, 2022).

9. Discussion

As mentioned in the previous section, the National Agricultural Policy from 2013 favours private sector organisations '[...] since the agricultural sector is the main engine of agricultural and economic growth as a whole, it is the objective of this policy to provide a favourable environment for effective participation of private sector organisations [...]' (MAFC, 2013). CSOs and NGOs, such as Agriwezesha, play an important role in reaching out to small scale farmholders. Among their 'duties' according to the NAP are: providing extension and credit services to smallholder farmers, funding community-based interventions and providing public services (MAFC, 2013). The government's reduction of subsidies and aid for small scale farmholders has forced NGOs to work and focus on multiple aspects of aid. According to One Acre Fund, access to finance, inputs and market access are the biggest challenges facing small-scale farmholders, which is corroborated by the data in this study (One Acre Fund, nd). The lack of access to financial credit leads to traditional agricultural techniques being used, which are labour intensive, a decreased yield and lower market prices (Mohamed & Temy, 2008).

'There are a lot of challenges facing the farmers we work with, general access is the biggest challenge. The infrastructure is very bad, and travel from village to village is very difficult, and even more complex to village centres. They need to pay for motorbikes, which is quite expensive. With better infrastructure they could access financial services like loans, but even then many banks will not grant them [the loans]' (Deograsia Ignas, Director of Agriwezesha).

As the study has shown, global shocks have affected small-scale farmholders use and access to fertilisers, which has implications on several levels. On the local level we can see that fertilisers are an important agricultural input for improving productivity. The high cost of fertilisers comes at the cost of reduced yield, or at the expense of other investments. On the national level, Morogoro is the ‘bread basket’ of Tanzania, and increased fertiliser prices coupled with the risk of reduced output can lead to inflated prices for staple foods. Reduced harvests and inflated staple food prices will have implications on poverty and food security. Implications on poverty and food security on a national level, on a large enough scale, will have implications for the SDGs. Although the study does not tend to be generalisable, it can be applicable to different settings. It also links the global shocks to national and local actors, and is therefore an interesting topic for further study. Additionally, the study carries importance as the majority of countries in the ‘global south’ had the SAPs ‘forced’ upon them, and may therefore have had similar experiences in regard to agricultural government policies. Thus, it is important to investigate the impacts of global shocks in other parts of the world, and how the volatility of the global market is affected by, and affects. Applying this study to other settings can produce knowledge on this relatively new phenomenon, and may have implication on future policies.

10. Conclusion

The research aims to identify and understand the effects of global shocks on small-scale farmholders. Moreover it aims to highlight farmholders point of view, and how they experience the effects. All data has been collected during field work with the help of Agriwezesha in rural Morogoro, Tanzania. The data has been gathered through semi-structured interviews with small-scale farmholders, the only criteria for farmers to participate was that they use fertilisers. The study aimed to fill a knowledge gap that currently seems to exist in academic literature.

PESTEL was used to analyse the data and understand the circumstances under which small-scale farmholders exist, work and interact. Finally, to answer the two main research questions: ‘*How have global shocks affected the access to and use of fertilisers of small-scale farmholders?*’ and ‘*What alternative strategies are they adopting in light of price increases?*’.

The study has provided reliable data confirming that the access and use of fertilisers has been greatly affected by the two most recent global shocks. The analysis displays a negative trend in fertiliser use and access for small-farmholders for a plethora of reasons regarding their specific context. Access was a recurring theme, and that the specific context of farmholders could exacerbate or ameliorate the changes in access to fertilisers brought on by global shocks. Along with the first research question, access was a central theme in the alternative strategies, or lack thereof, that farmholders implemented in light of the fertiliser price increases. Specifically, access in the form of access to knowledge and inputs.

The findings suggest that the global system is inherently interlinked, and disturbances in the ‘system’ are far reaching. A key finding in the case of Morogoro was the importance of infrastructure and how it, if developed, would significantly improve mobility and in doing so reduce the effects of global shocks.

As the research is based on a case study, there is a wide variety of further research possible. Firstly, further research can focus more in-depth on policy-making on different levels, and how well they are implemented in reality. Secondly, research on how to improve access of all forms that have been discussed in this thesis. Lastly, studies reviewing the fertiliser subsidies program effect and reach could be conducted. As many participants stated, it was very difficult to access the subsidised fertilisers, and further understanding of what is restricting the program from reaching its desired results will be crucial for future shock mitigation.

Reference list

- Alcoff, L (1991) *The problem of speaking for others*, *Cultural Critique*, 20, pp 5–32
- Anyago, A. (2022). ‘*Tanzania unveils budget to transform agriculture sector*’, *Farmers review Africa*. Available at: [Tanzania unveils budget to transform agriculture sector](#)
- Baffes, J. and Koh, W. (2023). Fertilizer prices ease but affordability and availability issues

- linger. [online] blogs.worldbank.org. Available at:
<https://blogs.worldbank.org/opendata/fertilizer-prices-ease-affordability-and-availability-issues-linger>
- Broom, D. (2023). *This is how war in Europe is disrupting fertilizer supplies and threatening global food security*. [online] World Economic Forum. Available at:
<https://www.weforum.org/agenda/2023/03/ukraine-fertilizer-food-security/>
- BTI (2022). *Tanzania Country Report 2022*. Available at: BTI 2022 Tanzania Country Report.
- Chambers, R. (1981). *Poverty Unperceived: Traps, Biases and Agenda*. World Development, Vol 9, Issue 1: p1-19. Available at:
<https://www.sciencedirect-com.ludwig.lub.lu.se/science/article/pii/0305750X81900735>
- England, Kim V. L. (1994) *Getting Personal: Reflexivity, Positionality and Feminist Research*, The Professional Geographer, 46 (1): 80-89.
- FAO. (2022). *FOOD RESILIENCE*, Africa Research Bulletin, 59(7).
doi:<https://doi.org/10.1111/j.1467-6346.2022.10717.x>
- FAO and WTO (2022). *Global Fertilizer Markets and Policies: A Joint FAO/WTO Mapping Exercise*. Available at: <https://www.fao.org/3/cc2945en/cc2945en.pdf>
- Germany, Federal Ministry for Economic Cooperation and Development (nd). *Tanzania, Politically stable and rich in natural resources*. Available at: Tanzania | BMZ. [Accessed: 15/05/2023]
- Global Hunger Index (2022). *Global Hunger Index Scores by 2022 GHI Rank*. [online] Available at: <https://www.globalhungerindex.org/ranking.html>
- Hederbrand, C. and Glauber, J. (2023). The Russia-Ukraine war after a year: Impacts on fertilizer production, prices, and trade flows. [online] Ifpri.org. Available at:
<https://www.ifpri.org/blog/russia-ukraine-war-after-year-impacts-fertilizer-production-prices-and-trade-flows>
- IFAD (2017). *The Field Report*. [online] Available at: <https://www.ifad.org/thefieldreport/>
- Ilinova, A., Dmitrieva, D. and Kraslawski, A. (2021). Influence of COVID-19 pandemic on fertilizer companies: The role of competitive advantages. Resources Policy, 71(102019), p.102019. doi:<https://doi.org/10.1016/j.resourpol.2021.102019>
- IMF (2001). *Global Trade Liberalisation and the Developing Countries*. Available at:
<https://www.imf.org/external/np/exr/ib/2001/110801.htm>

- IMF (2012). *Managing Global Growth Risks and Commodity Price Shocks - Vulnerabilities and Policy Challenges for Low-Income Countries*, Strategy, Policy, and Review Department. Available at: <https://www.imf.org/external/pubs/ft/dp/2012/dp1202.pdf>
- Kalumbia, L. (2023). *Morogoro in race to attain high yields for food crops*, *The Citizen*. Available at: *Morogoro in race to attain high yields for food crops* | The Citizen.
- Kapoor, Ilan (2004). *Hyper-self-reflexive development? Spivak on representing the Third World 'Other'*, *Third World Quarterly*, 25 (4): 627–647.
- Kings, A. (2017). *Intersectionality and the changing face of ecofeminism*. *Ethics & the Environment*, 22(1), 63–87.
- Macrotrends (2022). *Crude Oil Prices - 70 Year Historical Chart*. [online] Macrotrends.net. Available at: <https://www.macrotrends.net/1369/crude-oil-price-history-chart>
- Miles, M., Huberman, A. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications, Inc.
- Minten, B., Stifel, D. (2008). *Isolation and agricultural productivity*, *The Journal of the International Association of Agricultural Economists*. Available at: Isolation and agricultural productivity - Stifel - 2008
- Mohamed, K., Temu, A (2008). *Access to Credit and its Effect on Adoption of Agricultural Technologies: The Case of Zanzibar*, *African Review of Money Finance and Banking*, 2008, pp. 45–89. *JSTOR*. Available at: <http://www.jstor.org/stable/41410533> [Accessed 20/05 2023].
- Mtaki, B., Snyder, M. (2022) *Grain and Feed Annual. Report no. TZ2022-0001*, United States Department of Agriculture: Foreign Agricultural Service. Global Agricultural Information Network. Available at: https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain%20and%20Feed%20Annual_Dar%20Es%20Salaam_Tanzania_TZ2022-0001.pdf
- One Acre Fund (nd). *Smallholder Farming - at the Centre of our Food Systems*. Available at: <https://oneacrefund.org/articles/smallholder-farming-centre-our-food-systems> [Accessed 10/05/2023]
- Palmas S, Chamberlin J (2020) *Fertilizer profitability for smallholder maize farmers in Tanzania: A spatially-explicit ex ante analysis*. *PLoS ONE* 15(9): e0239149. <https://doi.org/10.1371/journal.pone.0239149>

- Punch, K. (2005). *Introduction to Social Research—Quantitative & Qualitative Approaches*. London: Sage.
- Saccone, D (2021) ‘*Can the Covid19 pandemic affect the achievement of the ‘Zero Hunger’ goal? Some preliminary reflections*’. *The European Journal of Health Economics*. vol. 22(7), pages 1025-1038. Available at:
https://ideas.repec.org/a/spr/eujhec/v22y2021i7d10.1007_s10198-021-01311-2.html
- Scheyvens, Regina (2014). *Development Fieldwork A Practical Guide*, 2nd ed., London: SAGE. 288 pp
- Sultana, Farhana (2007) *Reflexivity, Positionality and Participatory Ethics: Negotiating Fieldwork Dilemmas in International Research*, ACME: An International E-Journal for Critical Geographies, 6 (3): 374-385.
- Tanzania Invest, (2021). *Only 20% of Tanzania Cultivated Area is Applied With Fertilizers*. Available at: <https://www.tanzaniainvest.com/agriculture/fertilizers-cultivated-area-2020>
- TFRA (2020a). *Bei Elekezi za Wakulima kwa Mbolea Aina ya DAP*. Available at:
<https://www.tfra.go.tz/uploads/documents/en-1598511443-20200811%20FIP%20DAP%20RETAIL.pdf>[Accessed 26 Apr. 2023].
- TFRA. (2020b). *Mamlaka ya Udhibiti wa Mbolea Tanzania*. [online] Available at:
<https://www.tfra.go.tz/uploads/documents/en-1598511608-20200811%20FIP%20Urea%20RETAIL.pdf>[Accessed 26 Apr. 2023].
- TFRA, (2023a). *Bei Elekezi za Wakulima kwa Mbolea Aina ya Urea*. Available at:
<https://www.tfra.go.tz/uploads/documents/en-1677651381-UREA%20SUBSIDY%20FERTILIZER%20PRICES.pdf>[Accessed 26 Apr. 2023].
- TFRA, (2023b). *Bei za Reja Reja kwa Mbolea ya DAP jwa Mfuko wa Kilo 50*. Available at:
<https://www.tfra.go.tz/uploads/documents/en-1677651475-DAP%20SUBSIDY%20FERTILIZER%20PRICES.pdf>[Accessed 26 Apr. 2023].
- Tanzania National Bureau of Statistics (2021). *National Sample census of Agriculture 2019/2020*. Available at: National Sample Census of Agriculture 2019/20 - Main Report Tanzania. National Bureau of Statistics; Ministry of Finance and Planning; Morogoro Regional Secretariat (2022). *Morogoro Region Socio-Economic Profile, 2020*. Available at: MOROGORO REGION.

van Vuuren, A (2000) *Female-headed Households: Their Survival Strategies in Tanzania*, ASC Working Paper 44. Available at: <http://www.tzonline.org/pdf/female-headedhouseholds.pdf>

WITS (2013). *Ploughing in Africa: The Story of a Chinese Sisal Farm in Tanzania*. Available at: [Ploughing in Africa: The Story of a Chinese Sisal Farm in Tanzania - ACRP](#)

World Bank (2021). *Agriculture, Forestry and fishing, value added (% of GDP) - Tanzania*. Available at: [Agriculture, forestry, and fishing, value added \(% of GDP\) - Tanzania](#)

World Bank (2022). *GDP growth (annual %)* | Data. [online] Worldbank.org. Available at: <https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg>

Appendix 1

Interview Guide

- How long have you been farming?
- What crops are you cultivating?
- Have you always been cultivating the same crops?
- Approximately how much land do you cultivate?
- On how much land do you use fertiliser?
- Has the amount that you apply changed?
- Have the [increased] fertiliser prices affected you?
- Have there been any changes to fertiliser access?
- How has the access [to fertiliser] changed?
- Do you keep animals, and do you use their manure?
- How does fertiliser affect your farming practices?
- Do you think that these problems will continue to affect you?
- Are you getting any help from government organisations or NGOs?
- What help from the government or NGOs, if you could get it, would you want or need?
- What is the biggest threat to your farming practices?