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Master Thesis 2016
30 credits

Nested agricultural markets for food security

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Abstract

Future agricultural systems have to provide more than just food. Agriculture plays a pivotal role in solving the ecological challenges which humanity is facing, and in combating poverty and food insecurity in many developing countries. Agroecological practices are very well suited to improve the ecological and environmental track record of agriculture. But how can agroecological practices help to increase the incomes and consequently improve food security of farmers in a developing country context?

To answer this question in regard to incomes from marketing products a multiple embedded case study in the Uluguru Mountains, Tanzania was conducted. Using interviews, observations and literature reviews, the study examined the available market infrastructure in four different market catchment areas to evaluate how this infrastructure is used and perceived by conventional and agroecological farmers.

The study shows that farmers have access to three different marketing channels: (1) the general market in form of formalized markets and farm-gate selling, (2) direct selling to final customers and (3) direct links to larger buyers or producers. In the four examined villages most agroecological farmers sell the majority of their products on the general market where their products are not differentiated from conventional products. Still, agroecological farmers in areas where agrochemicals are not available can increase their incomes by sustainably intensifying their production through agroecological practices without the need to access specific markets. On the contrary, in areas where the usage of fertilizers and pesticides is common, farmers need access to specific markets to profit financially from agroecological practices. Due to a structural lack of value chains for agroecological products, farmers also engage in constructing these themselves on a local level with mixed success.

Agroecological practices can help to increase incomes of farmers by increasing yields but also by providing better marketing conditions. To achieve the latter the introduction of agroecological practices has to be accompanied by the construction of new markets which value the quality of agroecological products differently.

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1 Introduction – Food Security and Sustainability

The aim of this study is to show whether the application of agroecological practices can increase incomes whilst creating ecological sustainability if suitable socio-material market infrastructures are available, how these suitable infrastructures are designed and in which ways they allow farmers to market their product.

Globally, enough food is produced to nourish everyone (Chappell and LaValle 2011) and global trade makes it available where it is needed. Still around one billion people go hungry every day despite full stands and shelves in the markets. Although in absolute numbers, South-Asia has the most chronically hungry, the areas with the highest percentage of the population mal- and undernourished lie in Sub-Saharan Africa (FAO 2015). In Tanzania almost 35% of the population are malnourished (ibid.). These people do not have access to food due to insufficient resources to “acquire it by production, barter or purchase” (Pinstrup-Andersen 2009). Thus, food insecurity on an individual or household level in contemporary times is primarily an access question rather than one of production or distribution. As the majority of people in extreme poverty are rural dwellers, cynically those who have major issues of food insecurity are also those who are directly involved in agricultural production (Hellin et al. 2005). Accordingly, food security¹ on an individual level can best be achieved by lifting those concerned out of extreme poverty (FAO 2015). An effective way to do so is investing in agriculture, as agricultural growth is more effective in regard to poverty alleviation than growth in other sectors (Cervantes-Godoy and Dewbre 2010). Development in this sector is even more important in regard to an expected increase of food demand by 80% in 2050, which will have to be met while making agriculture more sustainable (Chappell and LaValle 2011).

But which kind of agriculture should be invested in to meet the triple goal of poverty reduction, environmental sustainability and increased yields? In recent years, accompanying the foundation of the “New Alliance for Food and Nutrition” the “New Green Revolution” was proposed as the way forward (Holt-Gimnez and Altieri 2013). But in spite of the ecological and social track record of the last Green Revolution (Chappell and LaValle 2011, Patel 2013) it is unsure whether these kinds of high-input, highly mechanized and industrialized agricultural systems can fulfill the demands for sustainable agroecosystems that are needed in regard to the looming global ecological,

¹As defined by the FAO in their 1996 Declaration for Food Security the term refers to “physical and economic access by all, at all times, to sufficient, nutritionally adequate and safe food” <https://web.archive.org/web/20160120090050/http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>, accessed 20th January 2016

environmental and climatic challenges that have to be addressed urgently (McIntyre et al. 2008, Rockström et al. 2009, Stocker 2014). Rather, reducing poverty has to be accompanied by an environmental and sustainable agenda. Thus investing in agriculture should not only enable farmers to leave poverty, but also create pathways towards sustainability.

In regard to the second aspect, agroecological practices (AP) are a very promising approach as they are capable to respond to all of these ecological challenges. The practices include the utilization of biofertilisers, natural pesticides, crop rotations, terracing, intercropping, agroforestry systems, livestock integration and many more (see Wezel et al. (2014) for an overview over AP in temperate regions and Vandermeer (2011) for an overview in temperate and tropical regions). AP promote biodiversity by creating a benign agricultural matrix with more diverse landscapes and by drastically reducing the use of agrochemicals (Perfecto et al. 2014). They can mitigate climate change by lowering emissions and by increased carbon sequestration in soils (McIntyre et al. 2008, 46ff.), but also help to create diversified farming systems that are less prone to a full crop loss due to unfavorable weather conditions and thus enable resilience and adaptation in face of a changing climate (Holt-Gimnez 2002). Additionally, the reduced application of pesticides and nitrogen fertilizers compared to conventional agriculture helps to keep water bodies clean (Barataud et al. 2014). Adding to these advantages, some of these practices are easy to apply from a technological point of view, allowing quick wins while more complex systemic changes to agroecosystems are researched, prepared, and implemented (Wezel and Francis [in press]).

It has also been shown that agroecological practices have the potential to alleviate poverty (McIntyre et al. 2008, Chappell and LaValle 2011). Especially in comparison to traditional low-input farming systems, considerable higher yields can be obtained and crop losses can be minimized without the application of expensive chemical inputs providing a dual advantage for small-scale farmers (Pretty et al. 2011). Further, agroecological systems tend to have lower volatility in their productivity over the years and in respect to weather patterns (Holt-Gimnez 2002).

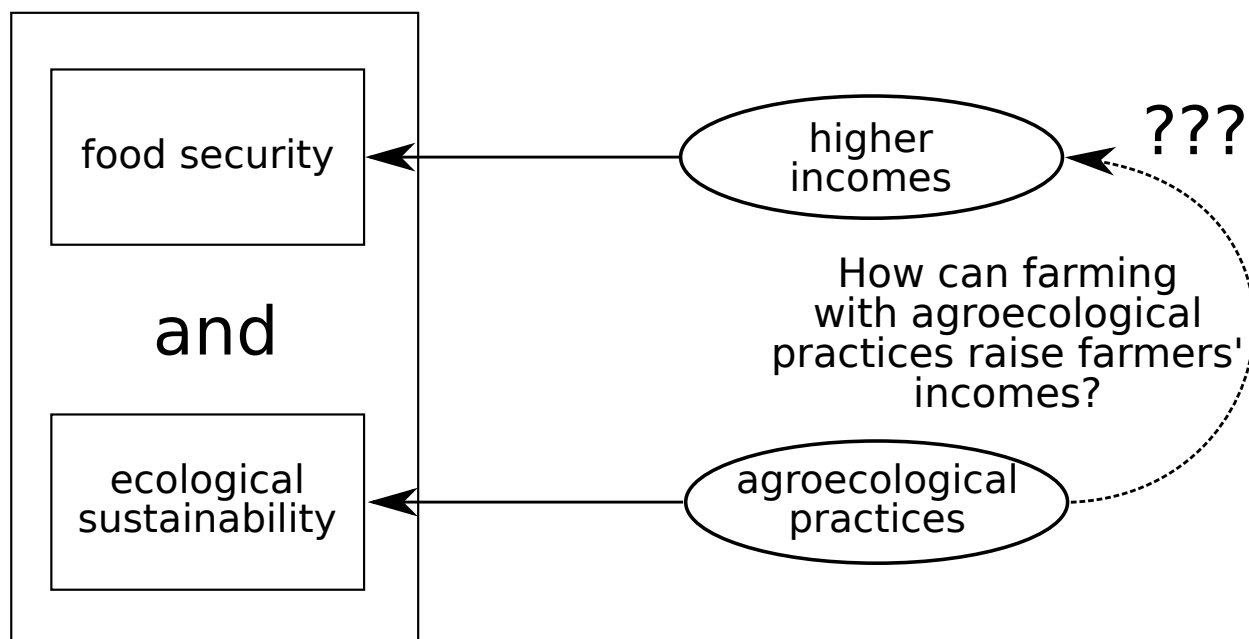


Figure 1: How can agroecology help to improve incomes of poor farmers?

To summarize, investment in agriculture is one of the best options to reduce food insecurity, especially among the rural poor. Agroecological practices fulfill the demands to a modern agricultural production system that is capable to be sustainable whilst having adequate productivity. Thus, as depicted in figure 1, the question is how to bring those two together: under what circumstances can farming with agroecological practices raise the incomes of farmers to lift them out of poverty to consequently reduce food insecurity?

1.1 Farmers' incomes originate on markets

Excluding subsidies, incomes can be increased by reducing costs and by increasing profits. Agroecological practices can help reduce costs in two ways, firstly by increasing subsistence production that lowers costs for food purchases, secondly by reducing use or non-adaption of costly inputs (see [Pretty et al. \(2003\)](#)).

Increased profits can be obtained by getting higher yields, better prices or a larger market share, this encompasses introduction of higher-value crops. Globally and also in the case of Tanzania, although there are certain outgrower schemes and contract-farms set up, most farmers earn their money by selling their products on markets. In regard to that, the potential to obtain higher profits for products from small-scale farms and agroecological farms lies in the market infrastructure the farmers have access to. This market infrastructure as a socio-material infrastructure, to use the vocabulary and theory of [van der Ploeg \(2014\)](#), can be comprised of many very different physical

market-places that enable farmers to exchange goods. In East Africa frequently observed types of markets that small-scale farmers have access to and use to sell their products are weekly or permanent markets, roadside markets, spot markets, mobile markets and farm-gate marketing but also formal contracts and informal agreements with buyers (Matondi and Chikulo 2014a).

Access to markets yes! But what kind of access to what kind of markets?

Marketing products is only possible if farmers have market access. According to a discussion paper by the *International Fund For Agricultural Development* there are three important aspects that frame the access to markets for small scale farmers: (1) the structure of markets, (2) physical access, as well as (3) the marketing skills and knowledge about markets (IFAD 2003).

The structure of markets can be quite unfavorable for small-scale farmers to sell their produce. Commodity markets are often designed or developed to serve a certain class of farmers, i. e. in case of Zimbabwe, before the fast-track land reform, the large scale white farmer community had control over large parts of the markets, something that is only slowly changing by newly emerging informal markets (Matondi and Chikulo 2014a). Similarly Okore (2014) states that in Tanzania, small-scale farmers are excluded from decision making processes in regard to rural markets, exerting no control on their implementation despite paying taxes for exactly this purpose, an issue that had been mentioned several times by interviewed farmers during this study. Other problems may include the uneven matching of farmers and traders, especially in remote rural areas, where only one or very few traders visit the villages in order to buy the produce, creating in fact a monopsonist trade system (Barrett 2008). This creates highly inequitable marketing possibilities, as the power relations are shifted in favor of the traders and intermediaries who can dictate the terms of the transactions (IFAD 2003).

Additionally over the last years, the supermarket sector in southern Africa has been growing significantly. Supermarket chains tend to include larger producers in their procurement strategy, as it is easier for those to meet the quality, quantity and safety standards required by the supermarkets (Weatherspoon and Reardon 2003). This contributes to the dis-empowerment of small-scale farmers on marketing questions, as a part of the market infrastructure is vertically integrated in the super-market's procurement strategy and a "free market" on which everyone could compete ceases to exist (Spoor 2014). Similarly outgrower schemes, although there are also positive experiences, can have an impact on monopolizing the whole input/output channel of an individual farmer, thus pushing farmers into very asymmetric power relations in which they find themselves dependent on the benevolence of their contractual partner (Dubb et al. 2016).

On a macro-economical scale, the access to international agricultural markets is often mentioned as a major possibility for farmers to compete with their colleagues around the world. Yet, only 10% to 15% of all agricultural goods cross borders (van der Ploeg 2014, Kay 2016). In regard to fruit and vegetable products in southern Africa, only 1% leave the continent while the rest is marketed on domestic and continental markets (Matondi and Chikulo 2014b). And even if food exports were essential in reducing poverty, there are – despite minor improvements over the last decades – large trade distortions in place. Mostly due to the agricultural policy of the OECD nations that heavily subsidize their farmers while the average nominal rate of assistance in many African countries is still negative (Anderson and Masters 2009, Introduction and Summary). This makes it, despite market access, impossible for farmers from developing countries to compete on international commodity markets.

On a more physical basis many farmers face direct problems of marketing their products on a local scale. In many cases it is not a lack of market access to the “global market” that makes it hard for farmers to sell their products (IFAD 2003). Rather, it is the lack of the socio-material infrastructure, of physical market places, means to transport the goods, and possibilities to not only exchange material resources but also information (van der Ploeg 2014). Although a wide variety of informal markets exists these are rarely places with necessary facilities and services. They have neither working scales, storage facilities, stands with shade and/or cooling, transparent protocols, clean water, hygienic clean areas, toilets nor safe places for trade (Matondi and Chikulo 2014a).

Even though market places may be close by, it is often difficult to access these due to insufficient road networks and/or means of transport. In these cases, even a country with potential to export on the “global market” without trade distortions has difficulties to market products domestically as well as globally, as long as the infrastructure is not working (Barrett 2008). Thus market access on a regional scale is rather comprised by physical than regulatory conditions that have to be met.

The third aspect of marketing skills and knowledge about markets is very well discussed by Hellin et al. (2005), in general arguing that low educational standards among rural populations also lead to a low understanding of marketing processes and market structures.

In face of these issues it is rather difficult to link small scale and agroecological farmers effectively to a large, already existing, highly regulated market-infrastructure, especially as many variables are so far out of reach of the majority of stakeholders (like the trade distortions) that overcoming them is a long-term challenge that can only be solved if many actors work concerted. Still many recommendations towards market access mostly look on the first aspect of the previous

analysis: the regulatory and macro-economic aspect as the major stumbling block that has to be overcome to integrate small-scale farmers in a global market.

But as mentioned above, most trade is performed on local, national or regional markets, it is not absolutely necessary to create access to continental and global markets (Kay 2016). Rather, the realities on the ground can be a starting point to create viable conditions where small-circuit market relationships could be created to increase economic activity and reduce poverty in a geographically limited area. In regard to this, the scientific community faces a lack of research, as still many international NGOs rather try to connect small-scale farmers with markets in wealthier western countries instead of focusing on local, national and regional markets (Shepherd (2007) as cited in Lie et al. (2012)). Additionally local, national and regional markets are less abstract and more transparent, thus the dynamics are easier to understand than the dynamics on global markets, enabling farmers an easier understanding of the markets they have to interact with regularly.

To address this under-representation of local, national and regional markets in policy advocating and to get an overview over the state of research on these markets the *Civil Society Working Group at the United Nations Committee on World Food Security* started to collect and analyze publications in regard to local market-infrastructures resulting in the publication of an “Analytic Guide” to “Connect Smallholders to Markets” (Kay 2016). This study tries to add to that pool of knowledge, especially in regard to benefits and difficulties for agroecological farmers.

1.2 Research problem

Local socio-material market infrastructures are rarely documented and not well understood. Still this could be one of the first steps to improve already existing market infrastructures and to build a viable theory on how existing market infrastructures can be of any help to achieve the above mentioned double goal of poverty reduction and sustainable agriculture. In this regard this study takes a local-first approach in the analysis of markets and their constituting actors by trying to understand the already existing market infrastructure comprised of formal and informal markets, their inter-linkage, local traditions, transport structure and exchange patterns and how they relate with physical access, the structure of markets and the involved skills of the farmers. A focus will also be laid on the differences of the utilized parts of the available market infrastructure for traditional, conventional and agroecological small scale farmers. Mapping and understanding these may be one of the most important steps towards transforming these market infrastructures to improved rural markets that can work for agroecological small-scale farmers.

1.3 Research questions

The study addressed the following three complexes of research questions in as much detail as necessary to discuss the modified question already stated in the [introduction](#):

Under what circumstances can markets help to raise incomes of farmers who are applying agroecological practices?

RQ I: Market infrastructure How is the current socio-material market infrastructure organized in the target areas? How and why does this hinder or enable small-scale and agroecological farmers in marketing their produce?

RQ II: Farmer characteristics How do traditional, conventional and agroecological small-scale farmers perform in the current market infrastructure? Vice-versa, how does the prevailing market infrastructure influence the decision of farmers to apply certain agricultural practices? Why are these differences in performance perceivable?

RQ III: Future development How could the current market infrastructure be developed towards an agroecological market infrastructure to enable agroecological practices, to increase food security?

2 Theoretical Framework – Defining a market

2.1 What a market truly is

As already indicated in the second part of the introduction the concept of “market” underwent a change in meaning leading to several concepts, with different theoretical assumptions denoting what a “market” is . While markets can be thought of as “market places” which are sites of “social interactions [...] where particular transactions take place between *specific* buyers and sellers who exchange *specific* goods and services according to *specific* rules” (emphasis added by me), they have been, since the dawn of the neoclassical economic theory, also thought of as rather abstract self-regulating dynamic systems of exchange (Hebinck et al. 2014b).

Although the second view is used in a variety of fields to assess, explain, and predict economic developments, the former may be of yet unanticipated value in rural development contexts. It suggests that markets can be approached in a way that is more understandable, more accessible, less abstract, and easier to influence, shape, and develop. Accordingly, it is not compulsory to think of markets as mathematically defined non-empirical constructs as neo-classical theory would have them. Rather scholars, politicians, and activists can recommence the quest of understanding markets from the ground up as empirically perceivable assemblages of potentially very complex and messy systems of actors, specific for each place, time and setting, heavily influenced by local traditions and culture (see Fligstein and Calder (2001)).

As this study focuses on markets for farmers who use agroecological practices, there is yet another incentive to think about markets this way. According to Hebinck et al. (2014b), farmers around the world are currently engaging in a diversification of their income channels *from agricultural products* by a variety of means. These new products are often of considerable added value, but this added value is rarely reflected in the prices obtained on established markets, leading to efforts of the construction of *new markets* to close this “structural hole” (van der Ploeg 2014). If these new markets are of “a different nature, different dynamics, a different redistribution of value added, different prices and different relations between producers and consumers”, they can be termed as *nested markets* that are, albeit connected to other commodity markets, encapsulated and separated by mostly non-material differences and often are formed by social struggles (Hebinck et al. 2014b). These new kinds of markets are emerging on all continents with similar but still unique characteristics and are often hardly conceptualizable with classic economic market theory as they are built around *specific* and unique entities (van der Ploeg 2014) ²

²See Hebinck et al. (2014a) for a comprehensive and elaborate introduction of the concept of “nested markets”.

These agricultural markets emerge in the center of grassroots activities, local, national, and global governance initiatives, market forces, NGO and CSO activity and have tremendous effects on the land-use practices, poverty, and environmental sustainability in a given area (Hebinck et al. 2014a). To understand and explain them within the above mentioned framework, empirical efforts from a variety of fields like anthropology, sociology, economics, and political ecology are needed. Utilizing these tools to collect and analyze data, nested agricultural markets provide a conceptual framework linking the construction of markets, their emerging governance structures and their intrinsic characteristics to the changing necessities to agricultural production systems and the accompanying adaption of the farmers life conditions whilst confronted with a variety of actors who seek to influence this development. Similar processes that are yet to be understood and analyzed are happening on a global scale right now; their dynamics are reinforced by the recent emergence of global environmental governance structures aiming to combat problems like climate change, loss of biodiversity and deforestation, where farmers are essential for the solution (Galaz et al. 2012, Morton 2016). The support or construction of nested markets that meet the conditions to reduce poverty and to support agroecological farming systems, could be a viable political tool within these environmental governance initiatives to strengthen smallholder and producer sovereignty on a local scale while contributing to a global agenda of environmental sustainability.

Definition of the socio-material market infrastructure

Accordingly the empirical determination of the “socio-material market infrastructure” is central for the analysis of farmers’ capabilities to market foodstuff and will be the basis on which to answer the above stated research questions. The socio-material market infrastructure is the entirety of all markets and embedded nested markets that are physically, institutionally, and socio-culturally accessible for farmers; the physical infrastructure that is in place to transport products of exchange to and from the market; as well as the regulatory infrastructure in place to allow and regulate the exchange on markets.

Reflection on markets as phenomena

“The market” is a something where scholars, activists and politicians frequently and undeliberately fall in the trap of the ontological reversal, especially when they are not aware of their own subjective judgment of the issue at hand (see (Francis et al. 2003)). The concept of “the market” in neoclassical economic theory is such a strong and foundational principle that it is (mis)taken for granted as “truth” instead of theory, whereby other economic theories, like political economy, become marginalized and thus underrepresented in decision making (my hypothesis, but I suppose Foucault (2012) would have agreed at a certain point in his life). The market becomes the “system” that steers everything: Adam Smiths invisible hand is nothing else but “the market”, a concept like a virus in the minds of many. Although this may not be true for academia, sprawling with Marxists and Feminists (Batterbury 2016), the widespread implementation of the “neoliberal project” shows that neoclassical economic thinking was and still is hegemonic in political arenas around the world (Sumberg and Thompson 2012). Still, as (Latour 2005) reminds us, and as did Husserl with his phenomenological approach before: Despair not and never stop looking at the thing itself, its relations and its embeddedness in a much larger ecological network, that becomes apparent to be much larger and more complex than we were ever able to think before (Morton 2016). To do so, theory is important, but theoretical concepts should never be more than that. They should never gain so much power that we stop wondering and start explaining where there is nothing to explain. If we let the observed thing speak for itself instead of redressing it in fancy words and codes, it gives the observed thing a more central position in our quest for knowledge (Latour 2005). The notion of market as defined by “nested markets” and as used in this study stems from the essence of this notion. It tries to give the market back the properties it was deprived of when put in the tight frame of the neoclassical market concept.

2.2 Definitions

To avoid confusion regarding certain terms that are used all over the thesis, below there are brief definitions of each important concept:

- The study adheres to the definition of “agroecology” as “the ecology of food systems” by Francis et al. (2003). “Agroecological practices” are solely used for production related practices on the farm-level, although they could have a wider meaning in regard to the definition of agroecology.

- The “food system” is the entirety of all infrastructures, processes and actions performed as well as the interrelationships between each instance of these to provide food for a population.
- “Agroecological farmers” are farmers utilizing agroecological practices. “Organic farmer” refers to a farmer who got an organic certification by one of the issuing institutions in Tanzania. Normally organic farmers are also agroecological farmers, although the certification process of the fruit-cooperative in Tandai shows that it can be possible to become a certified organic producer as a traditional no-input farmer without applying novel agroecological practices.
- Without distinction all products from agroecological, organic and traditional no-input farmers are referred to as “organic”, as the most important aspect for *customers* in regard to organic products is the absence of agrochemicals.
- The “quality” of a product is not predetermined. Rather the meaning of ‘quality’ is continuously renegotiated between actors who exchange products on the market ([van der Ploeg 2014](#)).
- Whenever there is a reference to a “specific quality” of a product, this refers to a specific, socially negotiated aspect of the product at hand. This may be an ideological factor like buying it first hand from a farmer or physical factors like the pesticide-free production or the absolutely flawless appearance of a product.
- The term “agrochemicals” is used for agricultural inputs that cannot be produced on-site, thus include artificial fertilizers, non-natural pesticides, hormones and growth agents.
- A “market catchment area” is the geographical site from which the products that are exchanged on one or several markets are sourced.
- The “performance” of farmers is their ability to sell their products at adequate prices. The performance thus depends on the grown crops, on the demand, on the transaction costs to bring their produce to the market, but also on the production cost, as the latter influences the “adequateness” of a price significantly.

3 Methods and Methodology

3.1 Methodology

To collect data about the socio-economic market infrastructure a case study approach was taken. A holistic observation of certain characteristics of the food system is well suited to happen in its real-life context to get a thorough understanding. (Johansson 2003). Further, the methods and tools from different fields can be incorporated seamlessly within a case study to provide different sources of data (Yin 2013).

3.1.1 Case study design

This paragraph is following the recommendations of Yin (2013) to describe a case study design.

The study was carried out as an embedded multiple case study. “Multiple” means that several cases are first studied and later synthesized and enriched with secondary data to constitute the final case study. The individual cases were all studied in geographically restricted areas with distinct market infrastructures (Tandai village, Nyandira and Langali village, Kenge village and Ruvuma village) south of Morogoro in the Uluguru Mountains, Tanzania (see figure 5 on page 22). In the following Nyandira is used to denote the case that also includes Langali village as they are part of the same market-catchment area.

“Embedded” means that, within each study of a single case, different scopes of analysis were applied. One for the whole market infrastructure and how it is generally organized (embedded case A), another one for the farmer community with a focus on each farmer’s practices, her farming systems, how she interfaces with the available market infrastructure and performs within it (embedded case B). For a schematic representation how the individual cases, their embedded cases, and the final case study relate to each other see figure 2. The embedded cases are designed such that the embedded case A serves to answer the questions posed under **RQ I: Market infrastructure** while the embedded case B serves to answer the questions under **RQ II: Farmer characteristics**.

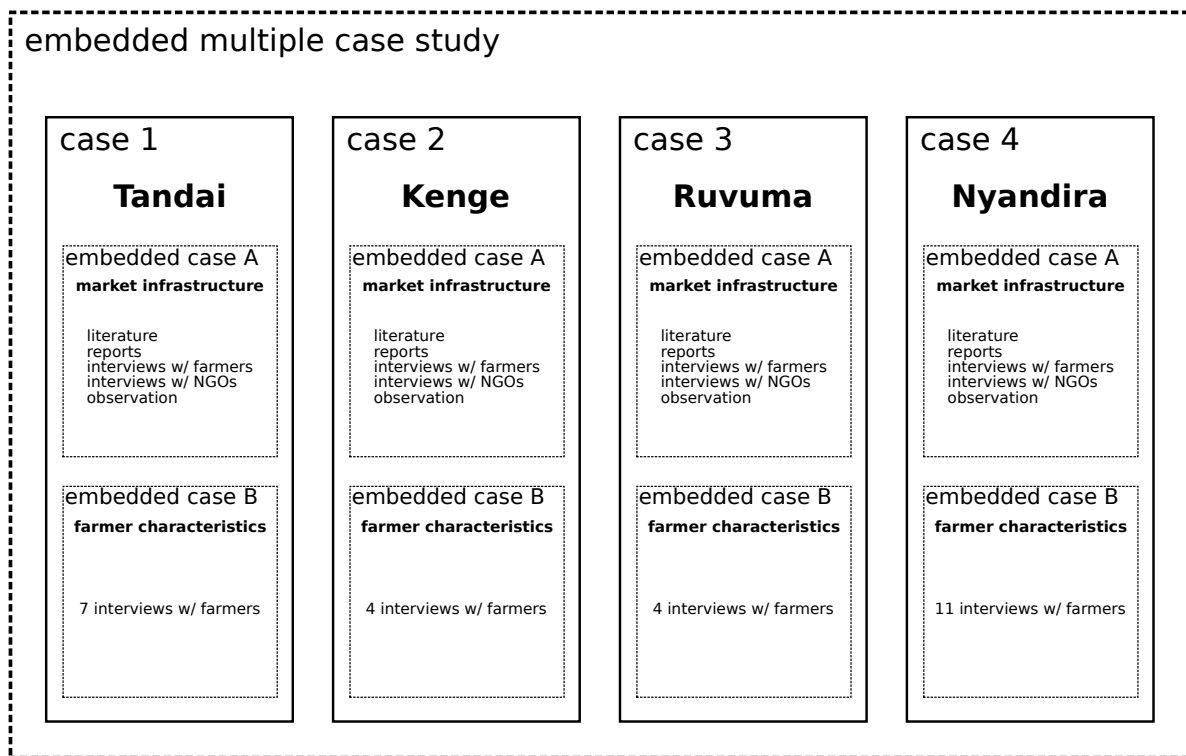


Figure 2: Four cases of villages with distinct local market infrastructures form the multiple cases while a distinct focus on the market infrastructure (A) and the characteristics of the farmers and how they perform in the market infrastructure (B) form the embedded cases in each case.

Reflection on holonic cases

To draw from some ontological theory originating in the holism that is favored in the Nordic agroecological school of thought, I regard each embedded case as a holon that has to be understood in its ecology of contexts (Bland and Bell 2007). The *embedded case A* is in this conceptual model a social holon that is constituted of other holons and contains all the entities and relations that affect the marketing possibilities of farmers and/or farmer groups. The ontological unit of the farmer characteristics on which the *embedded case B* is focusing is thus a constituting part of the market infrastructure, as the farmers and local traders are foundational for this entity. The holons, which constitute with their interrelations the market infrastructure, are on the other hand also the ecology of context of the farmer characteristics. Thus, the analysis of the market infrastructure and the farmer characteristics as single entities allows an analyst to draw conclusions on the interrelations between these two.

Unit of Analysis – the case

The case focuses on the socio-material market infrastructure³ that is in place to market foodstuff for *traditional, conventional* and *agroecological small-scale farmers*. This includes infrastructure (roads, storage facilities, warehouses, means of transport), farmers, traders, intermediaries, farmers organizations, NGOs, and local governments.

A temporal snapshot of the market environment is made with an concise overview over the historical development where needed. The target areas are four villages that act as local market-catchment areas. Final customers are, except when interacting with farmers directly, neglected as only direct interactions of farmers with buyers are considered.

The embedded case A puts the focus on the market infrastructure in itself with all the beforementioned constituting parts. The embedded case B focuses on the farmers as specific actors within the market infrastructure with a focus of their perception of and role within it.

3.1.2 Case study protocol - how and when to collect which information from whom?

As a “blueprint” for the four different case studies an “abstract case” was prepared by creating a “case study protocol” that defines the workflows, questions and methods necessary for data collection, as well as a list of relevant informants, timelines, schedules, and reflections on the working process. The case study protocol contains an overview over the context in which the cases are embedded, an in depth methodology with the data collection procedures and the data collection questions from which the interview questions are derived. The abstract case study protocol is specific enough for the single cases to be reproduced, as each case is a literal reproduction of the other cases and is set in a similar context except geographical differences.

3.1.3 Case study database - the storage room of collected data

The case study database contains all the collected data, original and derived. This includes all the available audio recordings, transcripts and summaries of interviews, field notes, and observations. Further it contains derived data, like the individual and regional market maps (see next section). Additional content are photographic material that was collected on the different sites and a “paper matrix” – a kind of structured annotated bibliography. The case study database in anonymized form without the audio recordings is accessible [online](#)⁴ and an overview can be found in the appendix (see page A-29)

³as defined in *Theoretical Framework – Defining a market* on page 8

⁴<http://thesis.pekoson.net>

3.1.4 Case study reports - wrapping things up

For each of the four cases a report was prepared, containing the results of the embedded cases (see [Appendices](#) from page A-1). These case study reports contain in-detail information in regard to the found evidence for each of the two embedded cases as well as a general overview. The collected data in the case study report is referencing to the data-artifacts from the case study database and thus allows to trace the origin of each given piece of data, ensuring referential integrity. The results presented in the main text consist of a juxtaposition and summary of the results from the single case study reports. Hence all the information presented in [Results](#) (p. 22) can be found in the individual case study report of the corresponding case. This allows traceability of each chunk of information from the results in the main text, to the individual case reports, and from there to the case study database.

3.1.5 Data acquisition and analysis strategy

Figure 3 shows a conceptualization how the data collection, data analysis and the final case study reports are derived from each other and how these relate to the aforementioned case study protocol, database, and report.

The main evidence (*primary data* and *derived data* in figure 3) was retrieved from interviews with farmers and organizational personnel, scientific literature, reports of NGOs, and observations as defined in the abstract case study protocol. This data was then summarized and compiled for different purposes and added to the case study database. The data from the case study database was then used to answer the research questions related to the two different embedded cases A and B.

The summaries contain the encoded information from the transcripts of the recorded interviews and the additional information from field notes which were made during the interviews. This information was scrutinized in regard to specific categories of information and leads to the results of the embedded case B by utilizing supplementary data from literature, interviews of service personnel and observations (see figure 3).

First versions of the individual market maps (see next section) were drawn during the interview to verify its validity with the interviewee. These maps were enriched with secondary information from the results of the farmer interviews as well as interviews with organizational personnel and literature, especially in regard to “service providers” and the “enabling business environment”. The market maps in combination with additional information from the farmers interviews and sup-

plementary data form the corpus of the results for the embedded case A on market infrastructure. The flow of data from collection to final case study reports are conceptualized in figure 3.

The results of each case were then documented in the individual case study reports, that present the available information from each case, without drawing cross-case comparisons.

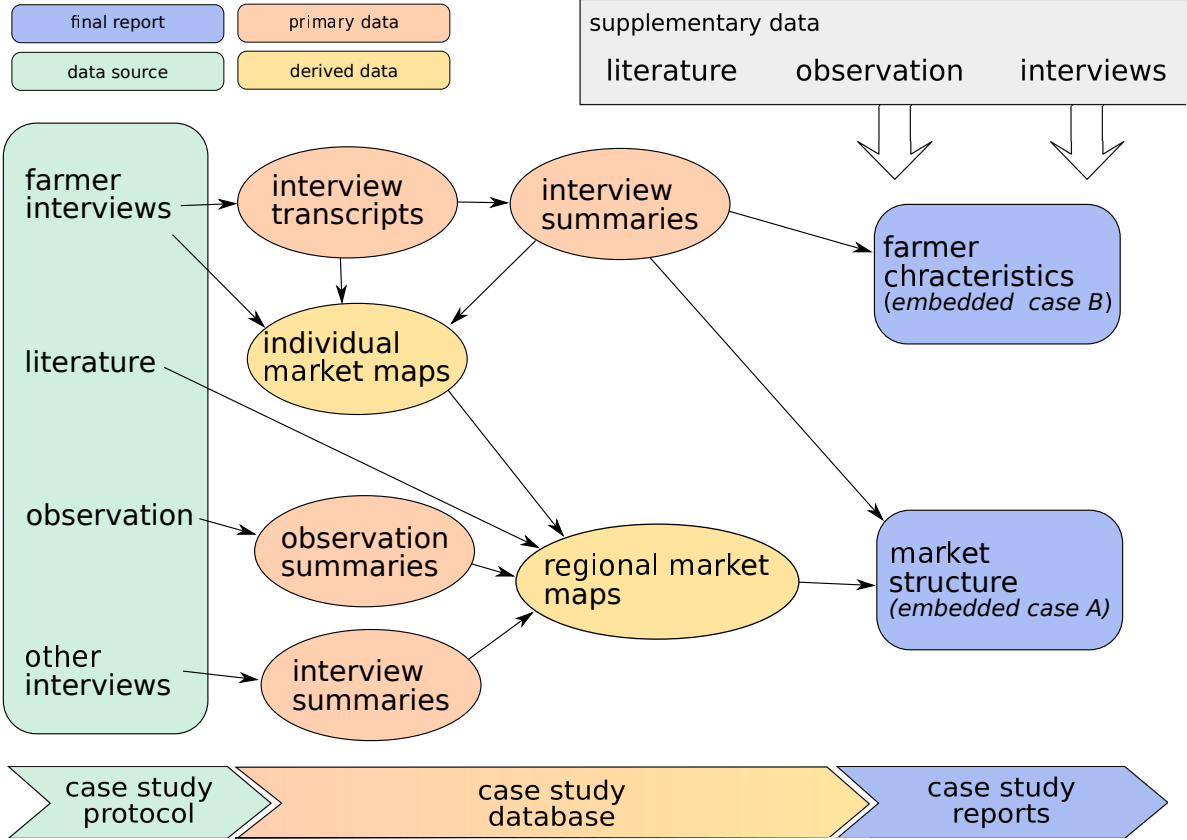


Figure 3: The two different embedded scopes of analysis to the right and the pathways through which the data for these were processed and analyzed for each case. The flow-arrows at the bottom indicate the association of the different elements with the case study protocol, database and report.

3.2 Methods

3.2.1 Methods used during data collection

For the data collection process different sources of data were used to triangulate the found evidence as much as possible. Primarily written documentation (reports and scientific journals), interviews and observation were used as sources.

Reports and scientific journals

This includes scientific papers, working papers of NGOs and transnational governmental bodies, documentation of MVIWATA in regard to their market integration schemes as well as documentations of other NGOs active in the region. Literature was systematically reviewed for relevant information considering the research questions.

Interviews

Interviews were conducted as semi structured interviews in each case study site with farmers, intermediaries, traders, MVIWATA members, farmer groups, member of non profit organizations, and village authorities. Spanning all case studies there are additional interviews with MVIWATA administrators, members of Sustainable Agriculture Tanzania (SAT), and members of Tanzanian Organic Agriculture Movement (TOAM). The non-farmer interviews are referred to as interviews with organizational personnel from now on.

The interviews for organizational personnel and farmers differed significantly. Organizational personnel was generally interviewed in English in a rather conversational atmosphere with a semi-structured approach that was open to follow any leads to data that might enrich the found evidence. It was not necessary to work with an interpreter, thus the exchange of information was more direct and it was accordingly easier to guide the interviewee to talk about the topic of interest.

The interviews with farmers were all carried out with an interpreter and in a more structured way, with a part that resembled more a survey and a part with open ended questions. The survey part was to determine general characteristics like farm size, cropping practices, household size, side jobs, income distribution between farming and side jobs, economic well-being and farm characteristics. In total 27 interviews with farmers and 15 interviews with organizational personnel were conducted (see table ?? and page A-29 for a full list of interviews).

Observation

Observations are information gathered by myself through landscape reading, transect walks and literal observation of physical road, farm and market infrastructures, the logging of GPS data and orographic characteristics.

Landscape reading and transect walks were used to determine the overall characteristics of the landscape in the area, especially in regard to its cultural and natural landscapes, the prevailing cropping practices, visible signs of erosion, degradation and the like.

GPS data was collected to determine the exact location of the villages and their altitude above sea level.

Observations were written down during the field work and digitalized as soon as possible. Whenever possible photographic evidence was collected to support the statements made in the observational reports. The observations for each case are summarized in the observation reports [TaObservation](#), [MObservation](#), [RObservation](#) and [KObservation](#).

3.2.2 Methods used for analysis

Market Map

Inspired by market maps that conceptualize the flows of goods from farmers into the trade system (see [Hellin et al. \(2005\)](#)), the analysis of the socio-economic market infrastructure of farmers is based on the analysis of these kind of market maps. Market maps consists of a relational mapping of the (1) “market chain, its actors and linkages” who constitute the core of the exchange processes together with (2) “service providers” who keep the socio-economic market infrastructure running through their contributing services and the (3) “enabling business environment” consisting of “infrastructure and policies, institutions and processes that shape the market environment” ([Hellin et al. 2005](#), p. 119). These three parts reflect the cornerstones of socio-economic market infrastructures as defined in [Theoretical Framework – Defining a market](#).

The form of market maps as chosen by [Hellin et al.](#) is not usable in this study, as [Hellin et al.](#) focus on the whole value-chain for one specific product group, whereas this study focuses on all products of a farmer, but only the first transaction in the chain. Accordingly, the design of the market map was changed to show the relevant entities, actors, and processes for the first exchange step while keeping the above mentioned general constituting elements. Thus for each farmer a map containing all three elements of the aforementioned elements is drawn to get a conceptual picture – a map – of her market reality. See [figure 4](#) for an example of an individual market map of a farmer in Ruvuma as used in the analysis.

In a next step all the maps showing the individual socio-economic market infrastructure of an individual farmer were merged and enriched with secondary and supplementary data to create a map of the regional socio-economic market infrastructure as available in the market-catchment area (see [figure 6 to 9](#)).

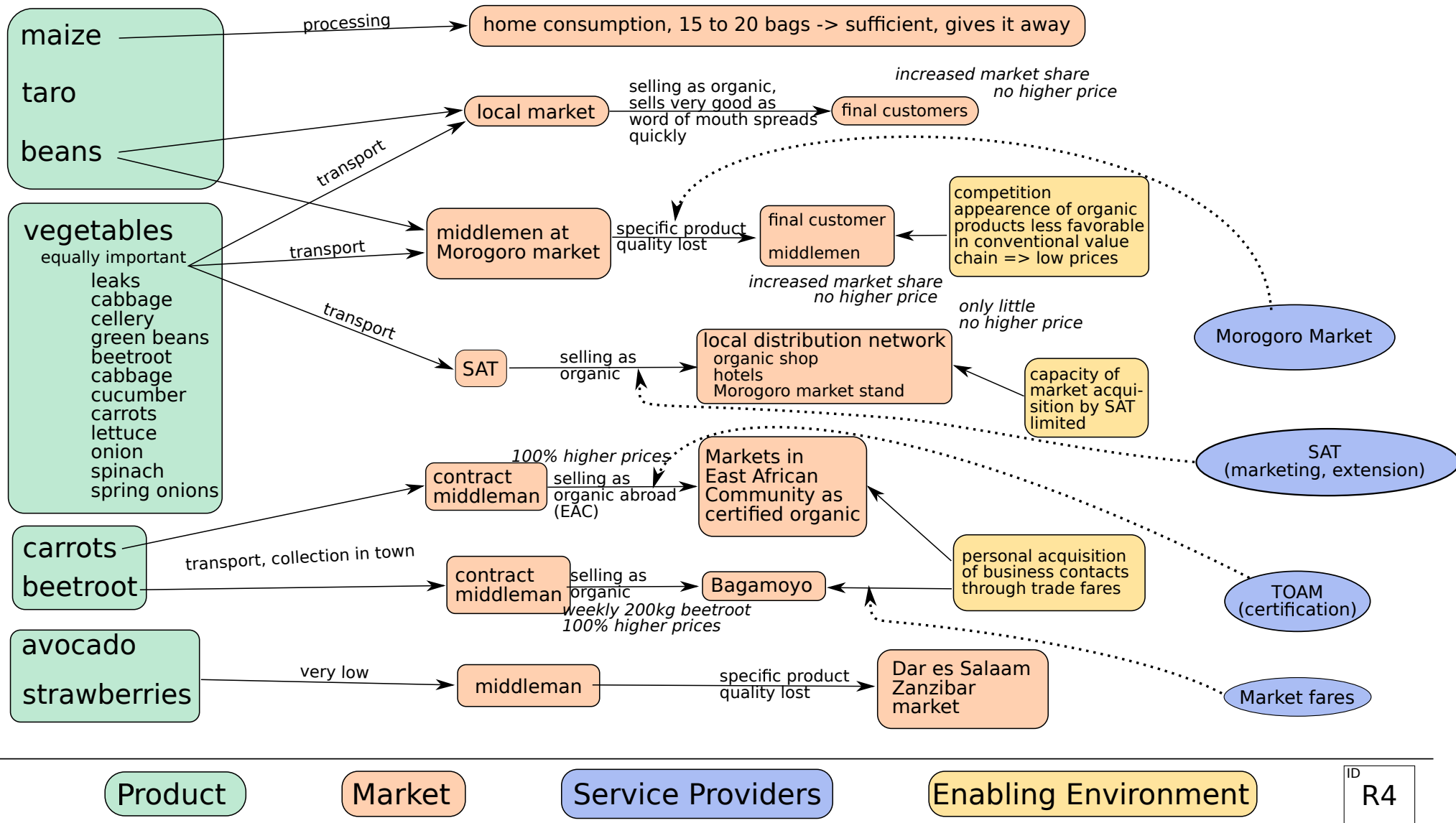


Figure 4: An illustrative market map, showing the market chain, its actors and linkages, the service providers and the enabling business environment

Theoretical background

According to Latour (2005) the social sciences are too often susceptible to the fallacy of “hidden entities”. Hidden entities would be something like “the global market”, “capitalism” or “the society”. These hidden and all too often non-empirical entities are introduced to “explain” phenomena, although maybe the “explanation” of the phenomena by these entities adds nothing to explain them but much to advance the notion of these entities, most likely also advancing a political agenda. This mirrors the notion of the ontological reversal. Following, Latour tries to ground empirical knowledge about “the social” by rendering the direct relations between actors explicit. To do so, although “encoding” of data was mentioned before, I consciously tried to not interpret the data in this step by sorting it into categories of not-yet discovered conceptual entities that are taken for granted. Especially as there is already an intermediary “interpretation” step by utilizing an interpreter who certainly imposed his world view to certain aspects of the said. Accordingly I tried to leave the collected data as close as possible at what was said and observed, by not including assumptions and explanatory notes derived from hidden entities in regard to the behavior of actors. Still thoughts of “this is because of <some hidden entity>” were frequently re-occurring and had to be purposefully neglected.

3.3 Limitations of the study

The case study approach is well suited to describe the available market infrastructure in an area and to get examples of working strategies to cope with available market situations, but it gets very tricky when evaluating the performance of farmers. Therefore, in the following a very subjective impression of the “performance” of a farmer on the market has to be used.

To really estimate whether different farmer groups are performing differently on the market, a statistical analysis of a larger number of farmers in a given region, based on a rock-solid quantitative metric to measure “performance” would be necessary. Neither of both could have been achieved in the scope of this study, thus to get an impression of the market performance a heuristic metric based on the ability to sell all the products, the availability of different reliable marketing channels as well as the farmers’ personal assessment of marketing ease is used.

Reflection on performance

Performance of farmers on the market is – inherent to its qualitative definition – difficult to measure. The income is not a good measure, as a farmer with a lot of land can perform really bad on the market and still can have a good income, whilst a smallholder with half an acre can perform tremendously well and is still struggling. The income per unit-area-time is maybe a better indicator to measure performance, but what about someone growing high-value crops who gets a bad price vs. someone selling staples and who, against all odds, gets always good prices? This is not made easier by the difficulty to question farmers about their farm size, or even their yearly income. Thus another proxy for farmer performance has to be used. In the case of this study, the performance is determined by the ability of farmers to sell their products; by the number and diversity of the reliable marketing channels used; as well as by their personal assessment regarding their marketing ease.

4 Results

The presentation of the results is split in three parts. First an overview over the cases is given with information on the climate, geography, interviewed farmers, infrastructure, and the dominant agricultural practices in the area. This is followed by a cross-case presentation of the available market infrastructure (embedded case A) and the farmer characteristics (embedded case B).

The full individual case reports are given in the section [Appendices](#) from page [A-1](#).

4.1 Overview over the location and infrastructure

All villages are located in the Uluguru Mountains south of Morogoro, see figure 5.

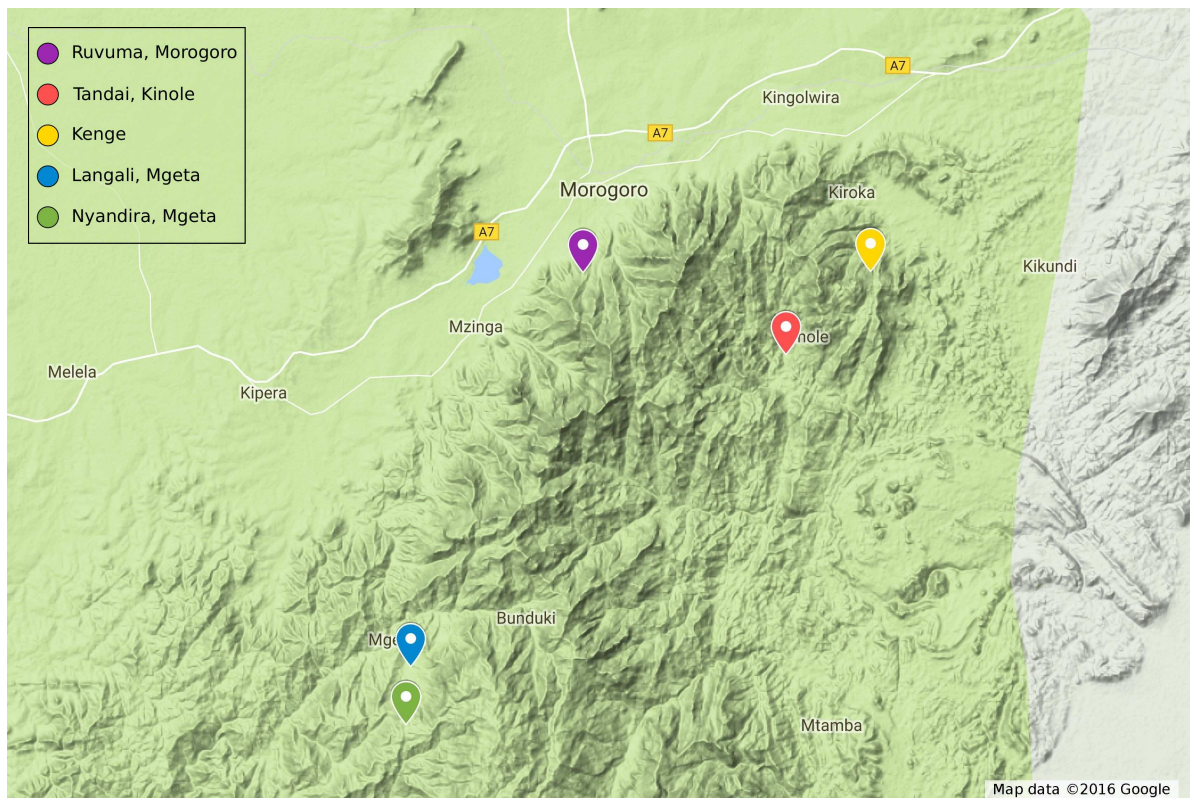


Figure 5: All the villages are to the south of Morogoro on the slopes of the Uluguru Mountains, with Ruvuma close to Morogoro and Nyandira, Langali and Tandai further in the center of the mountains. Kenge is on the way to Tandai, but not accessible by motorized vehicles .

The climate in all four villages is tropical savanna climate that changes to a humid subtropical climate in the higher altitudes. The two villages on the eastern slopes (Kenge and Tandai) as well as the village on the northern slope (Ruvuma) receive higher amounts of precipitation as the rain is generally brought by tropical easterlies during the rainy seasons that are partially blocked by the Uluguru Mountains. The more easterly Nyandira village and Lanali village get less rain, as

they lie lee side of the mountain (see Lovett et al. (1993) for a more detailed discussion of the climate characteristics of the Uluguru Mountains). Sites at higher elevation additionally get some rain during the dry season due to rising air masses causing convective rain events. The climate is generally favorable for agriculture and also for certain forms of livestock rearing, as the average temperatures are lower and rainfalls are more equally distributed than in the surrounding tropical savanna region in the plains with its long dry season. Still there are tremendous intra-regional differences due to the large variation in altitude within each village, making climatic generalization difficult.

The Uluguru Mountains are source to many small brooks, generally providing high potential for irrigated agriculture on many slopes. Irrigation is heavily used in Ruvuma and Nyandira, while it is barely used in Kenge and Tandai.

The access to the villages from Morogoro, the next major trading hub, differs significantly. While it only takes 10 to 15 minutes by motorcycle or car to reach Ruvuma, the ride to Nyandira takes 1 hour 30 minutes and to Tandai 2 hours 30 minutes on bad roads for the last 10 kilometers, and substantially longer during rainy season when roads can be barely passable. Kenge is not accessible directly by motorized vehicles; the closest village Soweto in the valley can be reached from Morogoro in one hour with another hour walk to the center of the village. The roads to Nyandira are in very good conditions whilst the roads to Ruvuma and Tandai are difficult to pass without all terrain vehicle. The necessity to carry all products from Kenge increases the transaction costs for the farmers, but this is also the case in the other villages where many farmers are dispersed in the mountains and have to carry the products to the nearest places where it can be marketed.

4.2 Overview over the characteristics of the interviewed farmers

In total 27 farmers, 5 farmer groups, and 1 cooperative from 4 different villages were interviewed on their detailed practices, the crops they produce, farming systems, and their marketing possibilities and strategies.

17 of the farmers are actively engaged with agroecological practices, 4 of them are certified organic farmers. Two more farmers received training in agroecological practices, but switched back to conventional farming after a short period of time. 11 farmers, all from Nyandira, regularly use agrochemicals, among those are 6 farmers who use agroecological practices on parts of their farm.

The agroecological farmers interviewed were predominantly female (3 male, 14 female). This gender bias might be explained by the fact that, for one, most agroecological groups emerged from

local saving banks that have disproportionately more women as members (Kato and Kratzer 2013, Maleko et al. 2013); secondly, the willingness to be interviewed was higher among female farmers in Langali. Additionally, the land tenure was traditionally passed on through the female line, and although this changed since the German colonial rule this legacy still favors land ownership by women in the Uluguru Mountains (Ponte 2001). On the contrary, the conventional farmers were disproportionately male (8 male, 2 female). This can be attributed to a ceremonial funeral that was obligatory to attend for women and took place during the field work day that focused on the conventional farmers in Tandai, thus favoring male respondents. In Nyandira the male/female ratio was even.

All interviewees cultivate farms between half a hectare to 2 hectares with most farms being around 1 hectare of size. Only three farmers had larger farms, with 2.5, 3 and 8 hectares respectively. In addition the farmers in Kenge lease or buy plots in the plane that also can reach 4 to 8 hectares but are only suitable for production during the long rainy period. Ponte (2001) reports that this is a common practice throughout the Uluguru Mountains, but in this case only the farmers in Kenge mentioned to adhere to this practice.

Most plots are on moderately steep to steep hills, with small plot sizes of several hundred to thousand square meters. Terraces are only common in Nyandira and Langali but have been started to be built in Kenge and Ruvuma after the initiative of the local NGO Sustainable Agriculture Tanzania (SAT). But as of now these terraces are only a minor fraction of the area and are primarily used for vegetable production. The farmers from Kenge and Ruvuma complain about erosion problems on the steep hills, and the diminishing capacity of the land to regenerate, something also reported by Ponte (2001) in his study in Langali.

In all areas the production of maize, bananas, and beans is one of the most important subsistence cropping practices. Supplementary staples like rice (both paddy and upland), cassava, potatoes, sweet potatoes, bananas and taro are grown in certain areas. Predominantly these crops are grown on steep slopes without terracing, except in Nyandira where terraces are very widespread and are also used for maize and beans. In Kenge, Ruvuma and Tandai staples are generally grown in a shifting agricultural system, whereas the farmers from all three villages report shortening of fallow periods due to increasing demand for farm land. This is accompanied by declining yields. Neither in Kinole nor in Kenge agrochemical inputs are used whilst there are considerable amounts of fertilizers and pesticides applied in Nyandira and Ruvuma; the application of agrochemicals is mostly done for vegetables, confirming the findings of Ponte (2001).

Each of the villages has a cash crop it is “specialized” on. The most important cash crops

for farmers in Kinole are spices (black pepper, cloves, cinnamon, and cardamom), pineapples and some other fruits, in Ruvuma and Nyandira vegetables (mostly cabbage, green peas, cauliflower, tomatoes, and leafy greens), and in Kenge ginger with an emerging vegetable sector. Bananas are grown as a supplementary cash crop in all the villages, except Nyandira where the high altitude interferes with good growing conditions for bananas. Several farmers claimed that they do not produce other products since there is traditionally a specialization that is common to each area, although it would be possible to diversify production (as can be seen from the emerging vegetable production in Kenge). Due to the agricultural structure of spice farming, there is a structural preference of agroforestry systems in Kinole and more than half of the interviewed farmers mentioned that they have crops and trees intercropped on some part of the farm. Still there is high potential to expand agroforestry practices in the area (Ruheza and Khamis 2012).

Animal husbandry is common in Nyandira where pigs and milk goats are owned by many households. Especially the introduction of Norwegian milk goats in the 1980s was a huge success. Nyandira is also the only visited village with an organized milk industry, processing goats milk to yogurt (Lie et al. 2012). In Kenge, Ruvuma and Tandai, there is a lot of interest in livestock rearing, but traditionally it is not widespread despite the common poultry rearing. In Ruvuma there are some initiatives to get cows in the mountain as roughage is abundant. Kinole and Kenge have significant amounts of goats, but only few farmers own them.

There are widespread complaints about pests and diseases. Most complaints were issued in Nyandira where a chicken pest eradicated at least half of the chickens of each interviewed farmer and another disease killed many fruit trees some years ago. In other areas mostly problems with tomatoes were mentioned.

4.3 Embedded case A – the socioeconomic market infrastructure

An overview over the market infrastructures of each of the four sites can be found in figures 6 to 9. The maps display the flow of products from farmers into the value chain from top to bottom. The utilization of the products can roughly be split in four categories:

- (I) domestic consumption of products, most important for staple crops like maize, rice, and beans
- (II) marketing on the general market via farm-gate contracts or on local formal markets
- (III) direct selling of products with a specific quality (either novel or organic products)

(IV) marketing via direct channels to larger traders, exporter or companies

The different categories are indicated at the beginning of each marketing channel in the market maps. In the following, the results of each of the relevant marketing channels are presented. Firstly, this is done for formalized markets and farm-gate marketing that form the backbone for agricultural marketing (category II) in all four case sites. Then, marketing by direct links and direct selling is presented (categories III and IV). Category I is omitted as the collected data does not allow any conclusive statements, except that most farmer families do produce around half of their needed staples for domestic consumption. The whole text of this section can be seen as an explanatory note to the four provided market maps.

4.3.1 Category II – General market

The general market is the most important marketing channel. When regarding the market maps 6 to 9, it becomes obvious, that category II markets are similarly organized in all four market sites. From the market or the farm gate the products go to local middlemen or “assemblers”, as (Mutayoba and Ngaruko 2007) calls them. From there, products are passed on to larger middlemen/brokers.

Formalized markets

Formalized markets are characterized by regular fixed market days, services provided to farmers and traders (market information systems, storage-, drying-, toilets-facilities, security) and in-place tax collection.

Langali and Nyandira in the Mgeta ward and Kinole, the ward of Tandai, have a local formalized market place for regional trade whilst farmers from Ruvuma can access the formalized market place in Morogoro and farmers in Kenge use the market place in Soweto. These kinds of markets are a cornerstone for marketing in each of the four sites (see figure 6 to 9).

The markets in Nyandira and Tandai were specifically set up to support small-scale farmers by MVIWATA and Fert in 2003 (FERT and MVIWATA 2009, Okore 2014). These two markets replaced informal markets that were held before. Since then, farmers regard marketing of foodstuff as easier and can generally obtain higher prices. The first can be attributed to the increased liquidity in the markets due to the fact that the markets have become well known and have been attracting larger numbers of traders. The increased prices for farmers can be traced to the establishment of

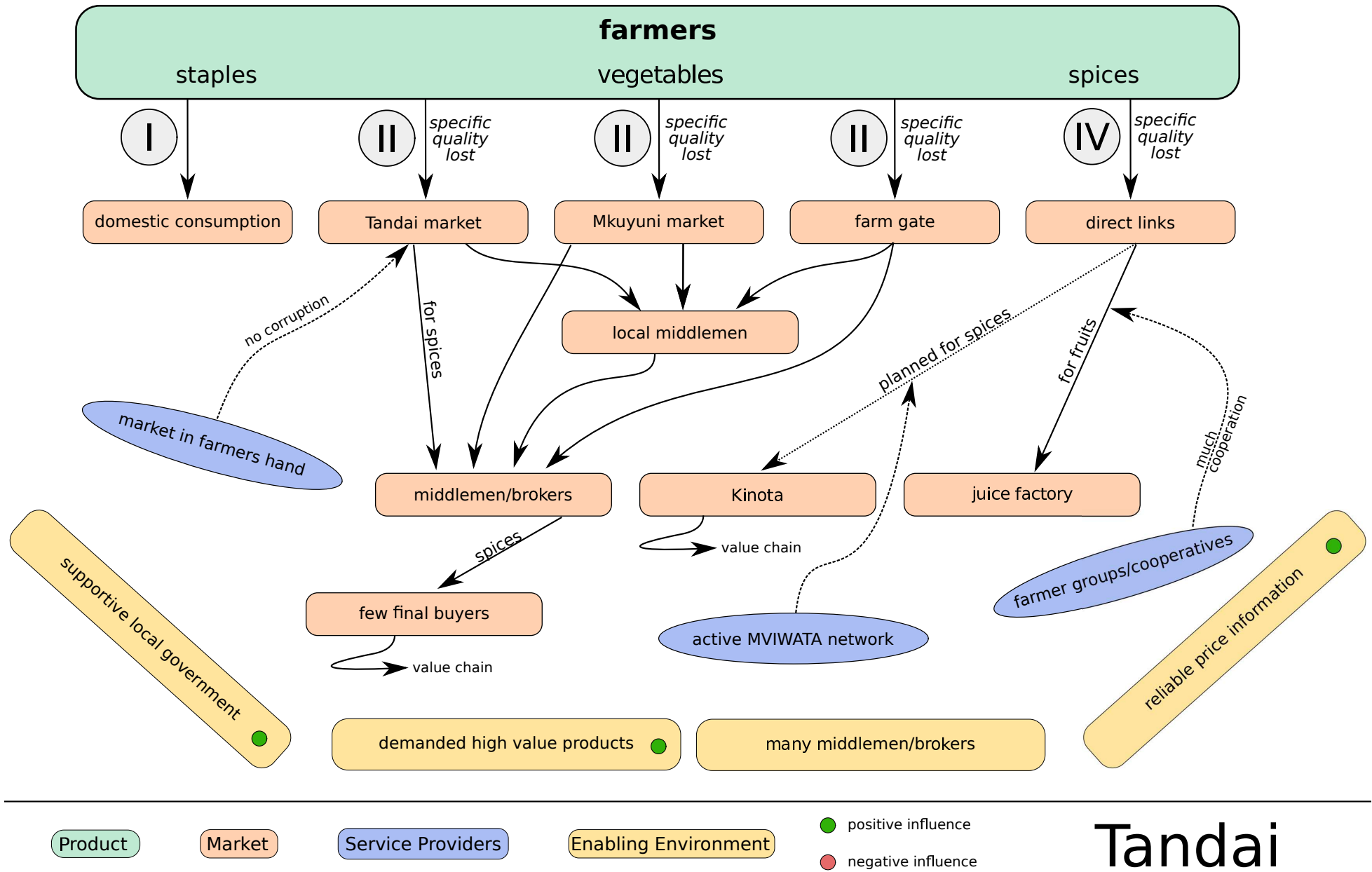


Figure 6: Tandai is characterized by a formalized local market in farmers’ hands, well established local farmer groups and cooperatives, and the complete lack of nested markets preferring organic products.

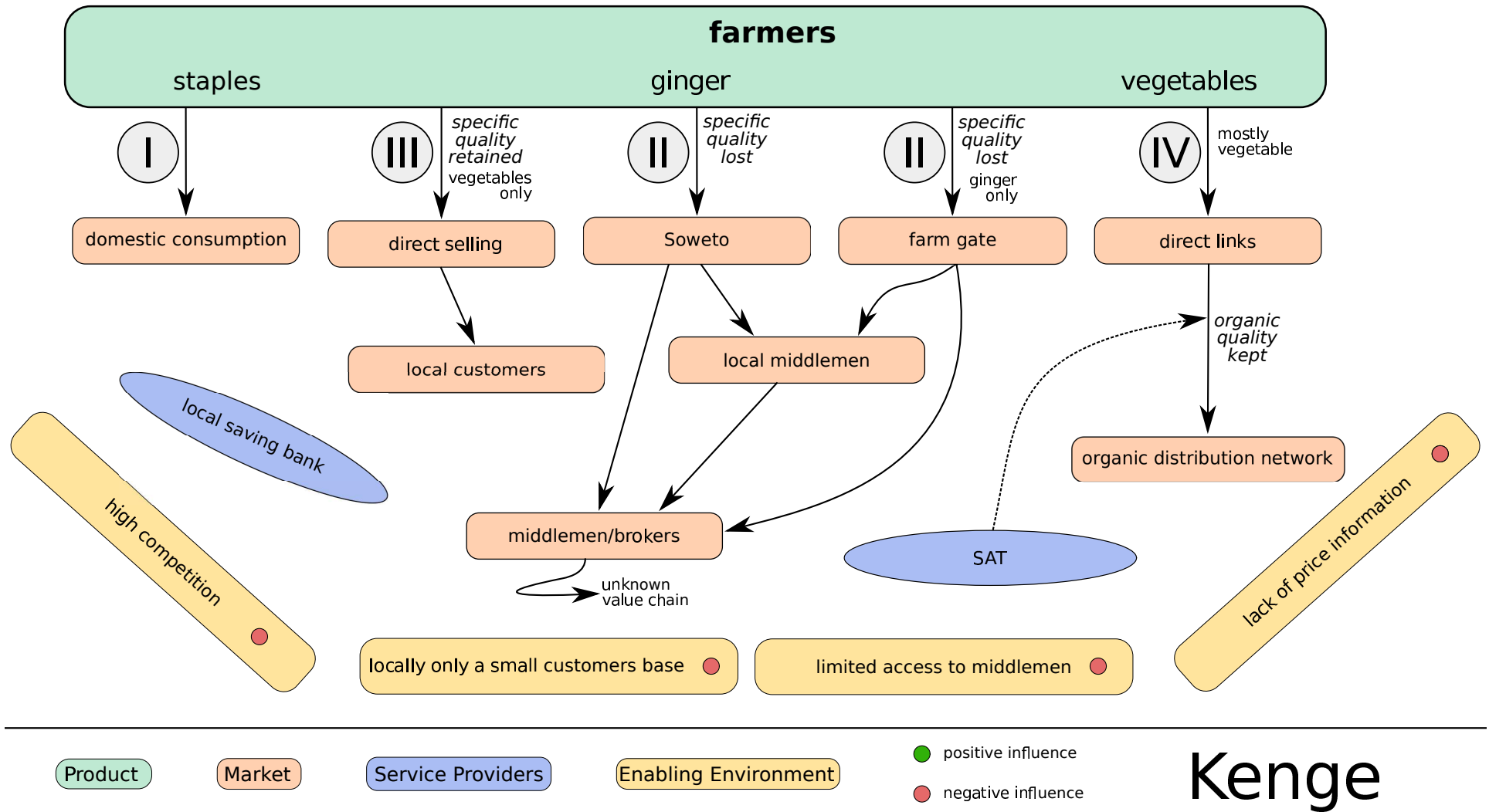
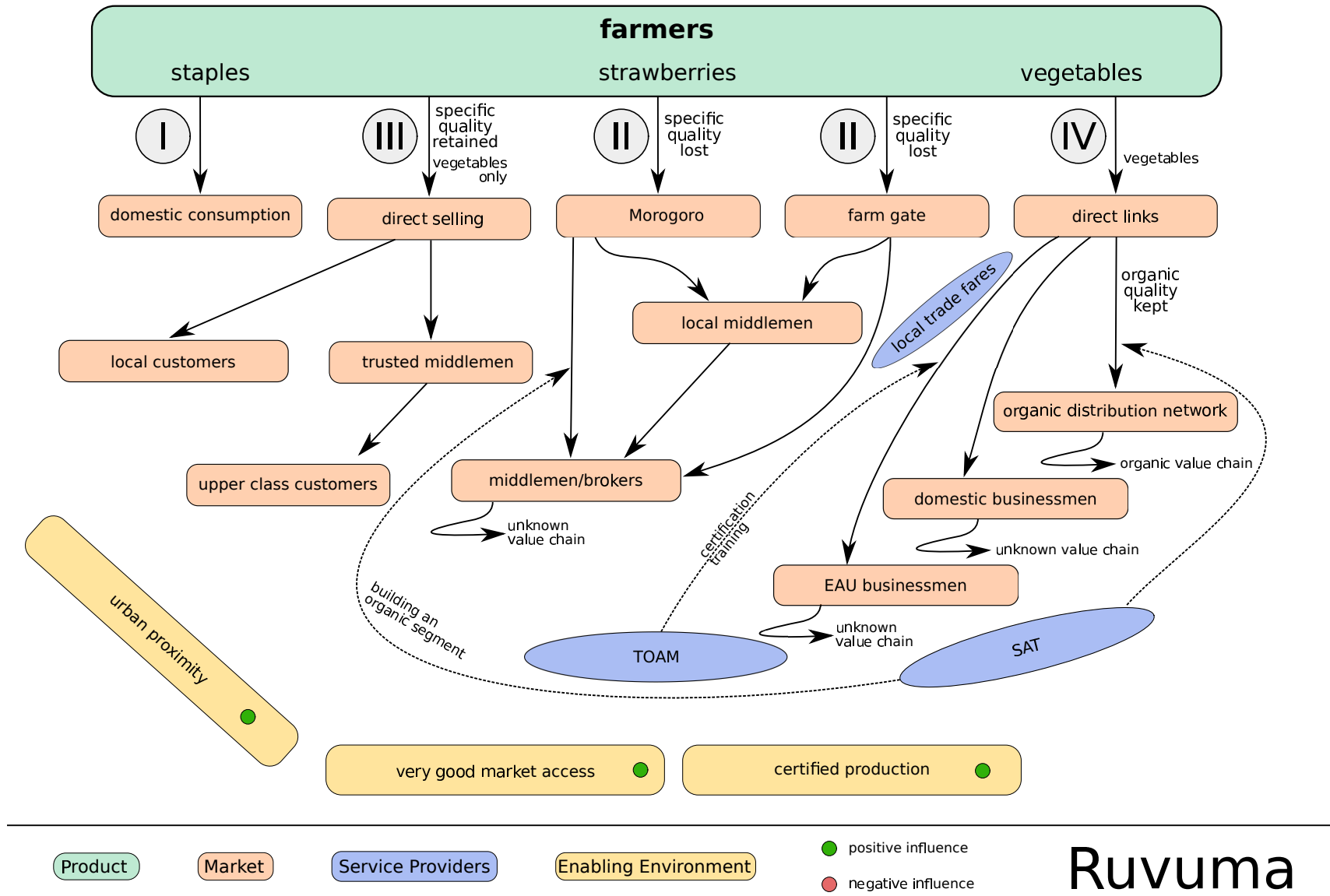
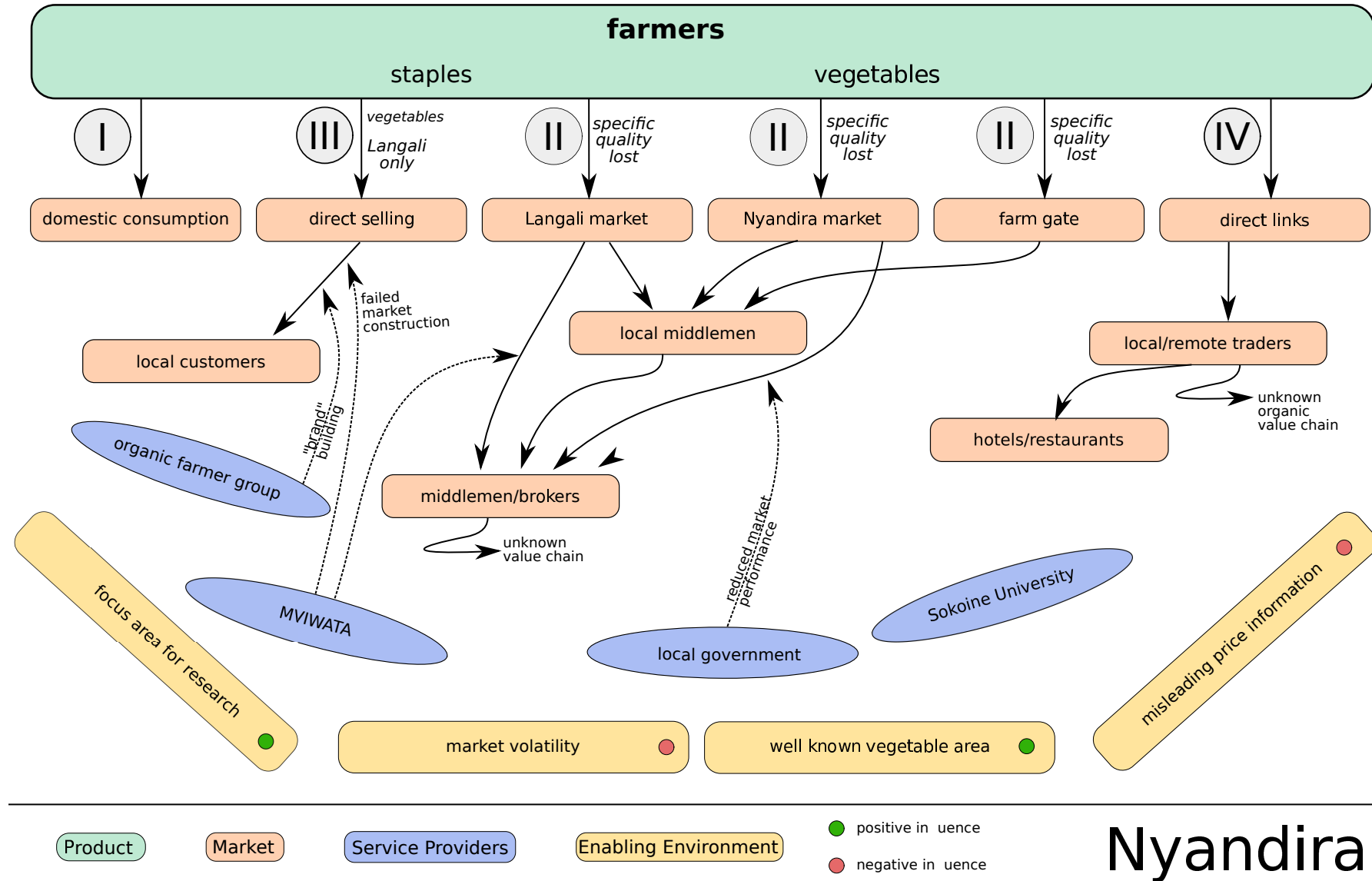


Figure 7: In Kenge the available market-channels are very limited, with a handful of middlemen controlling the ginger market and a very small local market for vegetables.



Ruvuma

Figure 8: Ruvuma is very close to Morogoro, benefits from the proximity to SAT as an NGO and has many farmers who can produce certified organic products as well as well established direct links with national and regional traders alike.



Nyandira

Figure 9: Nyandira has a large local market where sovereignty is currently renegotiated; this trade hub dominates the local market with many farm-gate contracts negotiated there. Organic direct selling could only take off in Langali.

price boards that display average prices from other markets to give the farmers a better bargain position, preventing that traders can set prices arbitrarily (FERT and MVIWATA 2009).

Recently both markets in Nyandira and Tandai have had issues with their respective local governments. These are normally responsible for running markets and collecting taxes but handed this duty over to the local market boards. Since recent changes in the tax regime for agricultural products came into force, tensions between the local governments and the market boards arose over collection and distribution issues. In Nyandira this led to a takeover of the Nyandira market by the local government and in Tandai to ongoing negotiations with the respective local government to settle issues. In Nyandira the take-over by the local government made marketing for some farmers more difficult as the market is now less organized and more chaotic. Notably farmers in Nyandira have been very dissatisfied with the price board as it has been displaying the prices the local middlemen paid during the last market day instead of average prices from other markets undermining the original intention of the board.

The market in Langali is very small. It is run by the local government and is mostly used for banana trade; still it is for many farmers the only possibility to sell their products. Similarly the Tandai market is the only accessible market around Tandai. Despite the mitigating effects of the price board it is perceived by many farmers as a market where they get low prices as mostly local middlemen buy their products to pass them on to brokers in the next bigger market in Mlali.

None of the markets has a specific infrastructure (space and processes) to sell organic products, although in Morogoro there is an initiative active to create one. This often leads to problems for agroecological farmers to market their products as they are facing disadvantages due to the different quality of organic products when selling on the general market.

Formalized markets are dependent on the local government to enable a working business environment. The interference of the local government to get more control over the local markets in Nyandira and Tandai, without providing equivalent services, diminished the functionality of the markets to the distress of both farmers and traders.

Farm gate selling

Farm gate selling is the marketing of larger quantities to contract partners without transporting the products to a market before they are sold. Buyers often approach farmers in the field, on markets, or by phone to negotiate terms when they are ready to buy.

There are two different modes of farm-gate selling present in the case sites. The first is marketing the products bundled with the right to harvest, applied in Ruvuma for vegetables and in Tandai

for spices and fruits. The middlemen who agree to this kind of farm-gate contract are normally local middlemen or assemblers who collect products to resell them to brokers arriving at certain times of the year on the market (Mutayoba and Ngaruko 2007). The second is to make a contract specifying the amount, price and place of collection to which the farmers have to transport the goods. The latter generally gives farmers higher prices, but there also incur higher transaction costs. In the rare cases where prices for the first and the second mode could be compared, the surcharge for harvesting and transport was so high, that the second mode would have been more profitable if labor was not a limiting factor.

In some places and/or at certain times, organizing farm-gate selling is difficult. There are either no traders available and/or there is such a high competition between farmers bringing products to the market places that middlemen prefer to buy these already harvested products as they can beat down the prices. On the contrary, in certain areas it is the common practice for certain products, especially those traded in higher quantities, like ginger in Kenge, cabbage in Nyandira but also low-quantity goods like strawberries in Ruvuma.

Farm gate selling is the farmers' preferred way of selling products for two reasons: the transaction costs are low, as is the risk of making losses compared to selling on the market where they run the risk of being unable to sell some or all of the already harvested products.

4.3.2 Category III – Direct selling

Direct selling is an exchange of goods with the final customers bypassing middlemen or processors.

In Kenge the farmers of the organic group started growing vegetables, products formerly not available in the village, and created a new market for these products by selling them roadside. In the first years, while the supply still was low, this market was large enough to take up all products the group produced, something that has been changing with an increasing supply of vegetables (see the section on the embedded case B).

In Langali, where the utilization of agrochemicals is high, all organic producers interviewed engage in door-to-door and direct selling for their organic products. By educating the customers about the positive effects of organic products on consumer health and environment they built a sufficient customer base interested in organic products. All of them claim that they get a higher market share than the non-organic producers when selling to local customers. The products are not sold to premium prices, although there is a “hidden” premium when the products are sold by piece and are smaller than the conventional counterparts.

Farmers in Kinole who live close to the road were selling already harvested products roadside

in small stands, something observed similarly for farmers in Zimbabwe by [Matondi and Chikulo \(2014a\)](#).

4.3.3 Category IV - Direct links

Direct links are actually a form of farm-gate selling with the difference of more personal, more secure relations and longer-term contracts with one or a few personally known traders or companies. These kind of marketing channels are discussed in this section, as it is outside the marketing backbone (category II).

In the four cases, there were some notable direct links created by farmers or traders. These were either utilized by groups or cooperatives as in the case of UWAMTAM in Kinole, or by individuals as demonstrated by one farmer in Ruvuma and Langali respectively. These direct links are outside the backbone of agricultural marketing and adhere to different ideas of quality, processes and trust. They are only accessible to a minority that benefits significantly in form of income security from these deals.

The fruit-farmer cooperative UWAMATAM has established a direct link to a juice producing company in Dar es Salaam which they can supply with different fruits, although the cooperative can only deliver if there is an order from the company. This channel is preferred by the members of UWAMATAM to other channels, as they generally get prices per weight rather than per piece, and as the visual appearance of the fruits does not matter at all. This makes it easier for them to sell their organic products that are generally smaller and would get lower prices if sold on a per piece basis on the general market.

One individual from Ruvuma established several links to buyers who have demand for organic products in Dar es Salaam and Bagamoyo. Due to his organic certification he is even able to sell organic products to other countries of the East African Union, bringing him high revenues at times. This farmer is also the only interviewee who could claim to get higher prices for organic vegetables, but it has to be noted that he is very active in the procurement of business links.

Similarly an individual in Langali sells organic vegetables to two middlemen who supply hotels in Dar es Salaam. Notably she does not have an official certification, but relies on trust that is built up from actor to actor through the whole value chain. She does not get higher prices for her products when selling to these two businessmen, but long term contracts are granted with orders arriving before the crops have to be planted.

Other setups that could be considered as direct links are the marketing strategies of several organic farmers from Ruvuma, who sell their products to “trusted middlemen” who then sell the

products in the upper-class areas of Morogoro as organic products, relying on the name of the group and the CEO of SAT as a trademark.

Generally, there are numerous companies and traders who seek to build up long-lasting relationships with farmers, but for farmers it is either hard to access these companies, or they are not able to fulfill the demand.

4.4 Embedded case B - The farmers place within the market infrastructure

4.4.1 Farmers' perception of agroecological practices

In the market-catchment areas where the usage of inputs is unusual (Kenge, Kinole and partially Ruvuma) there is a tendency that farmers who adopt agroecological practices have a very positive perception of agroecological methods, whilst the perception is mixed in areas where agrochemicals are common. The reason for this is mostly related to the different effects of agroecological practices on the farmers' farming system and yields. In areas where agrochemicals are not used, farmers profit from increasing yields, the diversification of marketing channels with their common or newly adopted products, more frequent cropping on their plots (increasing the yield per unit-time even more), and the availability of home-made pesticides and organic fertilizers.

The picture is different in the area where the use of pesticides and fertilizers is common (Nyandira/Langali). Farmers adopting agroecological practices there face a drop in yields, and also mention that products in certain product groups do not have the flawless appearance of products from conventional farms and/or are smaller, disadvantaging them when competing on the market. In these settings the absence of organic markets can lead to reduced incomes and difficulties of marketing the products when competing with conventional products.

Of course, conventional farmers in transition profit from a cost reduction as no inputs have to be bought if the farmers are capable to produce all the needed fertilizer on site. Something that is not always given, leading to the necessity to buy inputs in form of organic manure or compost from other sources, potentially creating business possibilities in the local economy. Also conventional farmers who are not capable to buy the necessary amount of agrochemicals deem agroecological plots to be more profitable. Unfortunately none of the farmers could present any numbers, still this was stated very convincingly as their subjective assessment.

In Ruvuma the positive perception of organic practices has another source: pesticides and fertilizers are common practice in Ruvuma, but the farmers have been facing sharp declines in yields despite its application. The reason for the low yields and ineffectiveness of artificial fertilizers is

most likely erosion-related. This was notably a major problem and according to the interviewees, preventing erosion by terracing, mulching, contouring and planting of trees while abandoning artificial farm inputs increased the yields again. Accordingly, the perception of agroecological practices is very positive.

4.4.2 Most important marketing strategies

The interviewed farmers can be assigned to five categories, according to their most used marketing strategy, although the data shows that almost all farmers try to develop hybrid strategies by utilizing several marketing-channels. The following five strategies are used primarily, matching roughly the aforementioned marketing categories:

- selling on the middlemen-based general market
- selling with middlemen based farm-gate contracts
- avoiding the general market by building their own market chain
- focusing on direct selling
- utilizing “alternative” marketing channels

These farmers are again either organic farmers, traditional no-input farmers or conventional farmers. The type of farm has no perceivable influence on marketing strategies except that agroecological farmers are able to access more “alternative” marketing channels in form of specific organic marketing channels or traders who build up local distribution networks.

Being an agroecological farmer or even a certified organic farmer does not by default give access to organic markets. Rather, several examples indicate that successful farmers are very engaged and try to set up diversified marketing streams spanning all five mentioned categories, utilizing the best option in each. Among the organic farmers proportionally the more successful farmers could be found. Be aware that this does not imply that organic farmers are generally more successful; instead it is likely that these farmers are still growing organic *because* they are successful, while other less successful farmers quit agroecological practices and continued with conventional farming, thus not showing among the group of agroecological farmers anymore (survivorship bias). Several less successful farmers (in terms of market-channel diversity and satisfaction with their income situation) pointed out that they lack the domain specific knowledge and time to engage in marketing and that marketing is a sole profession they happily leave to someone else. Leaving it

to someone else in most occasions boils down to feeding a long chain of middlemen, inevitably lowering the share that ends up in the farmer's pocket.

Still, being an agroecological farmer increases the probability to find new business links as potentially more markets can be accessed on a regulatory base ("certified organic"). One farmer from Langali actually was approached by businessmen because they learned that she produces organic products, giving her the opportunity for long-term farm contracts.

The chosen strategy of each farmer also depends on other factors than just proactive procurement of new marketing channels. To diversify their marketing channels it is beneficial for farmers to have

- novel products to construct new markets (like the farmers producing vegetables in Kenge did).
- access to NGOs or other organizations that link them to markets which are hard or impossible to access for individual farmers (like export markets or the construction of the organic distribution network by SAT).
- products of "different quality" that allow them construct local markets where different product qualities are valued (like organic, or like the free ranged "local chicken" very famous among Tanzanians, that are significantly more expensive and differ in taste from the industrially produced "Mzungu chicken").

4.4.3 Constructing nested markets and feedback loops

In Kenge, Nyandira and Langali farmers tried to create markets for their products around a presentation of their specific quality. In Nyandira and Langali for organic products, in Kenge for novel products (vegetables). In all three cases there were feedbacks between the farmers, the buyers, who are farmers themselves, and the crops grown. In case of Kenge and Nyandira these were negative, in the case of Langali positive.

In Kenge vegetables were only introduced two years ago. The farmers working with vegetables tried to build a market for the new products by selling it roadside in Kenge. This worked well for the first year, but demand decreased in the next season, as many former customers started to grow vegetables themselves on small plots whilst the organic group even quadrupled production, leading to an oversupply on the market, fortunately mitigated by a purchasing scheme of SAT.

In Nyandira almost everyone is a farmer and almost everyone produces similar products (see [Mgeta ward, Nyandira and Langali village](#) on page A-9). When some local farmers changed

their production to organic during a MVIWATA initiative they tried to establish a local market for organic products by educating people. The people were interested in the concept of organically produced vegetables as they are preoccupied with the healthiness of sprayed vegetables; thus they bought certain amounts from the new organic farmers. But the market collapsed completely when the next harvest was ready, as most of the buyers who were formerly interested in vegetables without pesticides started to grow vegetables for themselves on dedicated organic plots for home consumption. To the contrary, in Langali, only 6 kilometers from Nyandira downhill, the members of Upatachu are selling to customers directly on the market or door-to-door claiming their specific product quality. This market is established and has been working for several years now. All the interviewed farmers who started selling door-to-door continued with it and claim that they can sell their products faster than others their non-organic products, potentially leading to a higher market share. A possible explanation why the farmers were able to build up an organic market in Langali but not in Nyandira could be the different conditions of market growth. Whilst the farmers in Langali were steadily increasing the organic production area, it was kick started in Nyandira, creating too much supply for a non-existing or not-yet-existing demand.

Local markets for organic products in Tandai are very hard to establish, as there are only “organic” products available. This leads to the situation that the only possibility for creating markets with specific product quality beyond organic would be to claim other non-material characteristics. Quite the contrary, the current situation in Tandai seems to prevent the expansion of the corporate food regime as one interviewee referred to a farmer losing market shares because of his utilization of agrochemicals. Singing the same tune, local extension officers, the market board and other officials repeatedly mentioned the necessity of continuing and extending “good practices” in the area by which they meant sustainable ones.

In Ruvuma the farmers do not engage in selling the products themselves. Rather they collaborate with some trusted middlemen who sell the products door-to-door in the upper-class neighborhoods of Morogoro, where the organic products are well received. There, in Morogoro SAT is engaging strongly in setting up a local distribution network for organic products, benefiting Ruvuma above average due to its proximity.

4.4.4 How the market influences the crop choice

The data shows that the different areas are specialized in certain products (see the case study reports in the [Appendices](#)). Sharing a similar climate, the example of Kenge and Tandai shows that this is not due to ecological constraints. Both areas would be perfectly suited to grow spices and ginger.

But one location specialized on spices, where the other one specialized on ginger. This can have a variety of reasons the study could not verify or rebut.

A hypothesis for the markets' influence

Although the data is not sufficient to prove anything, the results of the study are indicating the following hypothesis:

The availability of middlemen who are interested in the specific commodity potentially plays a certain role. Whilst there are reportedly dozens of middlemen from outside in Kinole during the high season of spice harvest, there are not many in Soweto (next do Kenge), limiting the marketing possibilities for spice growers in Kenge. The same holds true for ginger buyers on Tandai market. The specialization of farmers on these markets is driven by the availability of marketing schemes, but also vice versa. When a certain product is abundant in an area and accessible, it seems likely that more traders target the area, increasing demand and consequently incentivizing production of the same product by positive feedback. Farmers who expressed their future plans only mentioned crops already grown in abundance in the corresponding area, indicating that the local traditions and knowledge have a strong influence on cropping decisions.

Focus on subsistence production and participation in outgrower schemes

Farmers who were focusing solely on subsistence production or were participating in outgrower schemes were not met during the course of the study. Still all farmers produced staples for their home consumption and were able to cover between one third and all of their needs from subsistence production, with an average of half their needs.

Additionally in Tanzania, many organic farmers rely on outgrower schemes, that follow rigid standards. This is mostly confined to commodities like cashews, sesame, tea and coffee that are mainly produced in different areas of the country. Although there are currently no ongoing projects, there is potential for the integration of contract-farming based *Jatropha* production in the agro-forestry systems of Tandai (Hoffmann et al. 2010). The rigid adherence to the regulation in the organic sector can create win-win situations that increase the farmers' income without compromising sustainability.

Differences in the general income situation

It is difficult to assess the performance of the different farmer groups, as it was very difficult to obtain data on the income situation. As a proxy for the general income situations, the ease to support school fees for the children was used. No intra-group comparison can be made, but a temporal comparison for individual farmers is possible. As a proxy for the income situation they were asked about the ease to support children before and after conversion to organic, or in the case of conventional farmers, whether it is easier to send their children to school now than several years ago.

Whilst none of the conventional farmers mentioned that the situation changed much over the last years, all the organic farmers who were farming organically for more than two years reported an increasing ease to send children to school, with some even supporting university students. But again, the data is not sufficient to exclude a survivorship-bias that would overrepresent farmers that are successful due to different reasons among the organic farmers, accordingly these results do not allow for any conclusive statement.

The performance of agroecological farmers

The performance of agroecological farmers on markets depends strongly on the region. Agroecological farmers in areas that have traditionally no-input farming have higher yields and report better product quality, giving them an advantage on the market. On the contrary, in areas where the use of agrochemicals is common, they face lower market shares if their products do not adhere to the accepted quality standards.

In these cases, the farmers have to become very proactive in building direct links with final customers or middlemen who are capable of providing them with a higher market share or even higher prices for their products. In these areas it is also important for farmers to get access to formalized organic markets that can be provided by NGOs, local governments and the like.

5 Discussion

Diversity helps: farmers benefit from well established market infrastructures

In the Uluguru Mountains, the market infrastructure is rather diversified. The visited villages all have access to a variety of well-established marketing channels and nowhere monopsonies or oligopsonies could be observed, although some farmers claimed that all middlemen are selling to the same broker, indicating monopsonies or oligopsonies downstream in the value chain.

Among farmers farm-gate selling and formalized markets (category II markets) are the most prominent marketing channels although the latter is met with more reservations, something [Mutayoba and Ngaruko \(2007\)](#) also observed in the tomato sub-sector in Morogoro. Still, the formalized markets set up by MVIWATA in Tandai and Nyandira have been reducing the asymmetry of power relations between buyers and farmers by increasing transparency and liquidity on the market whilst contributing to the local development as predicted by [FERT and MVIWATA \(2009\)](#) and already observed by [Okore \(2014\)](#). The availability of several marketing channels is an invaluable advantage for farmers. Although they may have limited bargain power, they are, due to the competition among the middlemen, not *completely* dependent on the goodwill of those. Still the availability of middlemen who are not the last member of a long chain of middlemen and therefore could pay better prices to farmers is very limited.

Context matters: why farm gate selling is not too bad in the Uluguru mountains

Although some studies found farm-gate selling to be a problematic and sometimes exploitative marketing channel for smallholders ([IFAD 2003](#), [Barrett 2008](#)), the farmers in all four market catchments agreed that farm-gate selling is their preferred and most profitable way of marketing. This differing perception of farm-gate selling is most likely caused by the different structures of the market and the products that are sold in the Uluguru Mountains and in the target areas of the above mentioned studies: the studies that deem farm-gate selling problematic often found monopsonies or oligopsonies and farmers who rely on selling staples on very intransparent markets, imposing very different dynamics onto the farmers ([IFAD 2003](#), [Barrett 2008](#)). On the contrary, in the Uluguru Mountains the market structure is better developed, with more middlemen buying the products and traders being available throughout the season ([Ponte 2001](#)), as well as price information systems that are at least working and available in Tandai, where price boards are scattered throughout the ward. The inability of middlemen to pay better prices to farmers is mostly driven by the structure of the value chain; there are some indications that the buyer market downstream often

ends in monopsonies or oligopsonies with negative transitive effects upstream, inevitably affecting also the farmer as the first member of the chain. In the case presented by Barrett (2008), these monopsonies in the downstream part of the chains formed due to high entry costs “into wholesaling, inter-regional transport and inter-seasonal crop storage”, limiting the competition among these service providers dramatically with negative price effects for the actors in the upstream part of the chain⁵. Still, the available farm-gate market structure gives the farmers a certain (although limited) bargaining power, temporal flexibility, reduced transaction costs, and lower risk of post-harvest losses *compared to other forms of marketing*.

Organic products in the value chain

In the formalized markets and on the farm-gate market there is virtually no market for organic products. There are currently no marketing channels available within this system that would handle and label these products differently. The majority of products from agroecological farmers are sold as conventional products losing their specific product quality during this transaction. Under these circumstances, the potential to compete on the market for agroecological farmers can be diminished, especially in areas with high prevalence of conventional farming techniques.

Making a virtue out of necessity: the emergence of local nested markets

The creation of direct marketing of organic products in Kenge, Langali and in Morogoro confirms the findings of Matondi and Chikulo (2014a) who claim that dynamic rural markets that are nested within the general market, can greatly contribute to the livelihoods of smallholders who sell products with a specific quality. These markets are built by farmers and trusted middlemen who are unable to find buyers appreciating the specific quality of their products in the general markets as described for various settings by Hebinck et al. (2014a).

All these markets are characterized by very short circuits between farmers and customers, with direct selling or short-circuit distribution utilizing one or two intermediaries. The products have a certain quality that differs from what can be bought on the general market. The buyers know the farmers personally and appreciate their work and their products; this, in turn, allows for the direct renegotiation of quality between customer and producer (van der Ploeg 2014). These dynamics are very present in the direct-selling marketing channels observed in the Uluguru Mountains. Additionally, cooperation among participants on these markets is higher and the organization among

⁵Products move downstream, money upstream

farmers is being advanced by the common cause they share. There is also emerging governmental as well as organizational support to construct and fortify these markets as can be seen in the initiative of SAT to build an organic distribution network in the Morogoro area.

These nested markets could be target for further development of local marketing structures for organic producers. There is a demand for organic products among the higher income Tanzanians as well as local customers who value “natural” products and are in certain cases even ready to pay a premium (Bakewell-Stone et al. 2008, Alphonse and Alfnes [in press]). The advantage of upgrading and professionalizing these marketing channels is that they already exist, links have been built and customer groups identified, alleviating much of the work that has to be done to construct new markets from scratch. A professionalization of these kinds of markets could lead, if handled properly, to much higher volumes in these markets, successively strengthening organic producers and accordingly food security and environmental sustainability. But the example of Nyandira and Kenge also show that this has to be done with great care in regard to the local context, and especially high awareness of potentially negative feedbacks. This is even more important when there is no good access for organic products to a market outside the farmer community as it is the case in Kenge. This issue has been tackled in a very foresightful manner by SAT who contractually agreed to buy the organic products of the farmers in Kenge, anticipating that they would have difficulties finding other marketing channels for their products.

Handling direct links is more difficult: among the interviewed farmers’ direct links with companies, larger traders were rather rare and generally farmers mentioned that this kind of marketing is very difficult and for many beyond their capabilities. Still, the returns for those who managed to enter these marketing channels were significantly higher and more secure. The difficulty to enter these markets could be related to the high entry costs for certain downstream market segments, similarly observed for intermediaries by Barrett (2008), holding true for farmers as well. The current initiative of Sustainable Agriculture Tanzania (SAT), trying to create a regional distribution network for organic products, could be a solution to this challenge for farmers, as SAT has the necessary capital and knowledge to pay the entry costs and to professionalize marketing while the organization still has the goal to keep the links short and the profits for the farmers fair. The SAT initiative is promising, but will face challenges as long as farmers cannot sell adequate quantities: farmers’ preference of higher volumes at lower prices to lower volumes at higher prices (see (Mutayoba and Ngaruko 2007)) could pose a problem to SATs acceptance as the pivotal marketing element.

Exploring new horizons: is there something like intercontinental nested markets?

Although I argue against the *necessity* to access international markets in the introduction, linking organic farmers to exporters who can give them access to foreign markets should be considered as an additional (but not the sole) possibility to market products. To access export markets in the EU and the USA, a certification that is comparably expensive is obligatory and not easy to get for small-scale farmers, but with group certifications and local schemes it is still a possibility (Barrett et al. 2001). As of now, there were no reports of anybody maintaining direct links to intercontinental export markets for high value products, although Akyoo and Lazaro (2007) mention initiatives aiming in this direction. Especially non-perishable high-value products like spices and coffee could be a good product for these markets (see Akyoo and Lazaro (2007))⁶. Building groups and working concerted is also beneficial to access downstream markets more directly. Still this requires a group formation process, something that is difficult to achieve in modern day Tanzania since the state-driven cooperative system catastrophically failed in the 1980s; there are, however, some new dynamics and a renewed interest in cooperative structures perceivable (Bergius 2014).

From another angle, we should keep in mind, that new information technologies and cheap intercontinental trade can help to not only build local nested markets, but that we currently can witness the emergence of intercontinental nested markets. In the European Union it is now possible to buy coffee directly from producer associations in Peru⁷, fruits from permaculture home-gardens in South-East Asia⁸ and spices from small-scale farmers in India⁹, building intercontinental direct links. These may geographically not be the shortest link, but socially they are. There is the possibility to have direct contact with the farmer producing the goods, negotiate quality, visit the farm online. This is accompanied by different dynamics in the market; demand is not revolving around standardized commodities anymore, but rather around a personal relationship to a coffee or spice farm where a customer gets her coffee, like the farmer next door where she gets her potatoes. By these means it could also be possible to build trust between farmers and buyers while cutting

⁶Sustainable Agriculture Tanzania just announced a research project to address spice marketing in cooperation with BOKU Vienna in November 2016.

⁷<http://ethicalcoffee.co/home>, accessed 2016-11-17

⁸<http://www.tropicalfood.eu/> accessed 2016-11-17

⁹<https://www.gewuerzkampagne.de/produkte> accessed 2016-11-17

costs of certifications, additionally allowing more flexible forms of agroecological endeavors¹⁰. Of course, at first glance intercontinental nested markets seem to oppose the general vision of many (more radical) agroecological practitioners and scientist who ally with food sovereignty movements vehemently criticizing international trade (Holt-Gimnez and Altieri 2013). But this is only superficial, the reason of this critique is not trade in itself, but its current form, that is, who controls it and who shapes it. Trade is a tool, and as such it is neither good nor evil, but its usage has consequences, positive and less so. Therefore, intercontinental nested markets are based on a wise usage of trade to empower local structures which, in turn, help contribute to food security, environmental sustainability and mitigate global change. Intercontinental nested markets are the logical consequence of fair-trade schemes in a more globalized and increasingly interconnected world. If small-scale farmers should be a viable part of future agricultural production systems, new trade regimes have to be built for farmers instead of trying to squeeze them into the corporate food regime that is intrinsically designed to make small-scale farmers superfluous (Murphy 2010).

The market question: when can markets help agroecological farmers?

Whether marketing is an important target area to improve the incomes of organic farmers depends on the regional farming structure. In case of areas with low- or no-input farming, like Kenge and Tandai, agroecological practices create by itself relatively high benefits on production side (higher yields per area-time, less pests and diseases, see Pretty et al. (2003) and Pretty et al. (2011)), diminishing the need to handle the marketing side separately to increase profits and incomes. This does not hold true if novel products are introduced (like vegetables in Kenge) for which no markets are readily available. Thus the introduction of cash crops should be handled with care as market building is a preliminary condition to successfully and sustainably introducing these crops.

On the other hand, if agroecological practices are promoted among farmers who use agrochemicals it is likely possible that these farmers will have lower yields and have products with a different quality (de Ponti et al. 2012). Additionally, agroecological practices like (additional) weeding, compost making, (more) livestock rearing and terrace building can increase the labor that is bound on-farm, decreasing the capacity to perform paid off-farm labor that is in many cases an important

¹⁰For example the utilization of minimal amounts of artificial fertilizers if adequate supply with nutrients cannot be guaranteed otherwise, i.e. in semi-arid areas where the availability of biomass and organic fertilizers is often very limited, or in certain tropical soils lacking various micro nutrients that are currently difficult to supply with agroecological practices. These practices cannot be labeled organic, but most likely aware customers would not oppose to practices that are not detrimental for the environment whilst benefitting their farmers.

source to sustain livelihoods (Bah et al. 2003). This can be mitigated by certain practices: Wostry (2014), for example, found compost making to be more economic than earning money off-farm to buy fertilizers (in regard to fertilizer obtained per invested time). Still farmers who switch to agroecological practices in these areas may face losses due to lower off-farm incomes, lower yields, and products of different quality for which no market exists or which perform worse in comparison to conventional products. If the saving by non-acquisition of agrochemicals does not compensate for these losses it is crucial for the farmers to have access to markets where they can get either higher prices, higher market shares, or both.

Of course, there is also a value in the preservation of fertility and farm-land quality by agroecological methods that can increase the overall profitability of agroecological farms *over a long period of time* compared to slowly degrading conventional farms. But incorporating these thoughts in a rational decision process is difficult, especially for farmers who often live from hand to mouth. Still in the face of land scarcity, soil erosion and high input prices (Ponte 2001), this argument could become what could tip the scales in favor of agroecological adoption despite lacking working market infrastructures.

Looming chance or looming crisis? Urbanization, land consolidation and secondary effects of agroecological practices

To support and channel the development of nested markets in order to achieve successful poverty alleviation while introducing agroecological practices on a large scale, another dominant process occurring in Sub-Saharan Africa has to be taken into account: urbanization. Urbanization goes hand in hand with an expected land-consolidation process in rural areas, as many farms with acreage far below one hectare can hardly be productive enough to stay synchronized with the general income increase when the gross domestic product is rising (see Dose (2007), Wiggins (2009), Murphy (2010)). Although agroecological practices favor smaller farms, due to the more labor intensive practices and the maximization of productivity per area (as compared to productivity per invested money in conventional agriculture (Woodhouse 2010)), it has to be clear that the farms have to reach a certain level of profitability to stay in the business. In regard to this there is a lower boundary for farm sizes that can still be profitable in a given environment even if funds for global governance (REDD+, Payments for ecosystem services, etc.) and other national and local subsidies are finding their way to farmers' pockets for their beneficial practices. This lower boundary is likely to change with a developing society, as it did in the EU and the USA. Accordingly, agroecological activists, scientist and practitioners have to take this almost inevitable

process into account. We have to know whether these processes are per definition detrimental to the introduction of agroecological practices or whether they can be utilized to the advantage of sustainable agriculture. Agroecological practices and the nested markets emerging from them can be a cornerstone for a diversified but still agriculture-based rural economy. A rural economy where not only nested markets for the selling of agroecological products are available, but also nested markets for agroecological inputs. In the Uluguru Mountains not all farmers have enough manure and compost to fertilize their entire farm adequately, and agents of bio-control against pests are not available, but both are perfectly suitable to be produced and distributed on a local level. Increasing farm sizes may give the chance to a specialization and diversification of rural economies where the farmers can be the center of economic turnover, encompassing rising incomes for farmers and their suppliers to achieve the dual-goal of poverty reduction and increased sustainability. Agroecological practices are not per definition a hoe and machete-based subsistence business where each farmer produces everything she needs on her own farm. Rather agroecological practices are based on cutting edge scientific knowledge, utilizing local and regional resources, perfectly suited to support prosperous local economies embedded in a prosperous global economy. In face of the looming change, this potential pathway should be explored, evaluated and, if deemed worthwhile, be put into policy as soon as possible to leave no one behind.

6 Conclusion

Agroecological practices have the potential to increase the income of farmers in several ways. Either by increasing them directly in form of sustainable intensification or by enabling farmers to access other marketing channels to increase their sold volume and/or their prices while cutting costs. But the latter is not necessarily an effect of agroecological farming. Many internal and external factors can influence how farmers perform after conversion: marketing skills, access to training and infrastructures, proximity to potential customers, crops grown and support by organizations. Still, the combined potential of reduced costs for inputs and access to designated markets for organic products has high potential to lift agroecological farmers out of poverty while increasing food security and environmental sustainability.

Constructing working markets for agroecological products is most important in areas where agrochemicals are used. Poor farmers can and should not be incentivized to convert to agroecological practices by environmental and sustainable reasons alone. Rather there must be an additional incentive – an economic one – providing them with a reason to invest in the risky endeavour of

changing production systems and entering new markets. This incentive could be generated on the market, by higher prices for organic products with their specific quality, or externally by subsidizing agroecological practices by means of funds available within global environmental governance structures; this is something this study did not touch upon, but could be utilized to improve the livelihoods of agroecological farmers in addition to building local capabilities.

Epilogue

This study illustrates, that it is not enough to address agroecological practices on the farm level, but that agroecological practices are more and more needed in the higher levels of the food system to create sustainable change. The best concepts do not inevitably succeed in the long run. Sometimes pure chance changes the path of history. Although failures are rarely anticipated, they are also rarely irreversible; rather we learn from them to take the next step. Now we have to work hard to increase the chances that the right decisions are made based on what we have learned. In this process, holistic approaches are getting ever more important. A case study on the local market infrastructure in a small village in the heart of Tanzania leads to global value chains, global information exchange and global governance. Everything is connected and we have to reflect this in the research we perform.

Acknowledgements

Mirjam, Amani, Roselynn, Nickson, Jordan, Alexander, Janet, Elisabeth, Michael, Mikhail, Jill,
Tor-Arve, Alexander, Charles

Thank you.

You are sowing the seeds from which a better world will sprout. You are among those who give us, as a species, the knowledge, care, wisdom, patience and insights it needs to embrace the responsibility we have. Project humanity cannot fail while having such exceptional individuals on board to keep it on track. Thank you for being there when I needed you. To the future!

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Appendices

In this section the results of each case are presented. The presentation is divided in an overview over the target area and its general geographic, climatic and infrastructural characteristic. This is followed by a presentation of its market infrastructure (embedded case A) and a presentation of the farmers, their practices and their relation to the local market infrastructure (embedded case B). Finally there is a discussion for each case where the differences between the individual market-utilization and also the intra-group differences if perceivable are presented and tried to be explained with the available information.

A Kinole ward, Tandai village

A.1 Introduction

The case study in Tandai was carried out during three days. In the course of the study the following means of data collection where performed:

- 7 interviews with individual farmers [Ta1, ... , Ta7]
- a group interview with the agroecological group called *Karoleni*
- an interview with the president and vice president of the board of the fruit-farmer cooperative UWAMATAM
- the local governmental extension officer
- the leader of the Tandai market board
- landscape reading to determine the general agricultural landscape and type of agriculture
- informational conversation with truck-drivers, buyers and sellers and motorcycle-drivers

A.2 Location, Infrastructure and General Land Use Practices

The Kinole ward is comprised of five villages with a total population of 13600, with Tandai being its largest village with 5807 inhabitants [TaRichard]. The village Tandai (lat -6.90901, lon 37.75748) is located in a south-east running valley in the Uluguru mountains, around 15km linear distance south-east of Morogoro (see figure 5). The landscape is hilly with steep slopes normally grown over with evergreen forests [TaObservation] (Lovett et al. 1993) (as cited in Segerstedt et al.

(2010)). Flat areas can only be found on the valley-floor alongside the waterways that carry water all year, most notably Ruvu river. Tandai village is at 500m asl, thus the same as the plateau from which the Uluguru mountains extrude. The amount of rain received by Tandai is exceptionally high; toward the forest-boundary in the higher elevations the climate gets cooler and subtropical (Lovett et al. 1993) (as cited in Segerstedt et al. (2010)).

The distance to the nearby city of Morogoro is 45km on dirt roads, half of which are in good conditions, while the rest is challenging for drivers and vehicles, but passable without special vehicles [TaObservation]. The average time needed to go from Morogoro to Tandai in dry season is about 2 hours 30 minutes by car, 1 hour 30 minutes by motorcycle and about 5 hours by truck [TaObservation].

The agricultural practices in the area are small scale with high amounts of incorporation of fruit and spice trees [TaObservation, Ta1, ... , Ta7]. While many fruit and spice trees can be found in the relatively flat valley floor, the slopes are dominated by pineapple cultivation, cassava, maize and upland rice [Ta3, TaObservation].

The average farm size in the area is between 1 and 2.5 hectares [TaRichard] (Ruheza and Khamis 2012). The main products of the area are pineapples, oranges, mangoes, coconuts, avocado, passion fruit, cinnamon, black pepper, cardamom, tomatoes, peppers, rice, maize and a variety of different pulses [Ta1, ... , Ta7, TaRichard]. Due to many tree products, many small-scale farms can be considered as utilizing agroforestry practices, where different fruit trees are intercropped with spice trees and black pepper climbing up some of these [Ta1, ... , Ta7, TaRichard]. Still there is a lot of potential to expand agroforestry practices (Ruheza and Khamis 2012).

According to all informants, no artificial fertilizers and no pesticides are used in the valley, only one person in the whole area is known to use agrochemicals, but other farmers try to convince him to abandon this practices. From all the interviewees, only one farmer ever used artificial fertilizers and pesticides once on his pak choi [Ta7]. Generally they regard their practices as organic farming, but some farmers articulate a distinction between agroecological practices and traditional low input farming [Ta1, Ta2, Ta3, Ta6].

Animal husbandry is not very widespread, poultry can be found through the valley, some farmers also keep sheep and goats, but cows are very rare [TaRichard].

A.3 Embedded case A: Market Structure

Tandai Market

There is one general market set up in Kinole: the market in the Tandai village [TaAneth, TaRichard]. It is maintained and run by a private company (the market-board); it was established with help of MVIWATA and FERT in 2003 (FERT and MVIWATA 2009, Okore 2014). The market is formalized and offers several services to the buyers and sellers. These include storage of products, drying of products (mostly spices), price information from other markets and toilet facilities [TaAneth, TaRichard] (Okore 2014). But also the local government is a beneficiary of the market, as the board is responsible for collecting taxes on agricultural products and passes these on to the local government [TaAneth]. Before the establishment of the market, exchange of products was happening more or less spontaneously in public areas [TaAisha].

Most of the interviewed farmers articulated reservation towards selling on Tandai market. Confronted with the question why they are reluctant to use the local Tandai market's infrastructure to sell their products it was mentioned that it is only a local market and there are no traders from outside present. Thus generally the prices are lower than in surrounding markets closer to urban centres. Accordingly farm-gate selling is often more lucrative due to the lower labor necessary for transport and the lower risk of post harvest loss of products that cannot be sold [Ta4, Ta5, Ta7, Ta3]. Other issues were, that some products are not traded on the market, thus no buyers for certain products are present at all (like bitter tomatoes), excluding certain product groups [Ta7].

Farm gate selling

The majority of farmers prefer selling directly at the farm gate [Ta1, ... , Ta7], as this increases their bargain power compared to occasions where they try to sell already harvested products; besides, it reduces the risk that they cannot sell already harvested products and have to face an economical loss [Ta4, Ta6].

There are two different modes of selling when products are sold at the farm gate. In the first, the farmer is selling the "right to harvest the products" to an interested buyer [Ta1, Ta2, Ta3]. This interested buyer then has to harvest and process the goods himself. It was mentioned that this job is often done by local people who are not middle-men, but rather some kind of "farm-laborers" that sell the products then to other local middlemen [Ta3].

The other possibility is, that the buyers agree with the farmer about the amount and price of

products to be sold and the farmer will deliver the products to a certain place at a given date and time [Ta7]. Other farm-gate arrangements are described under direct-selling, where the farmers are organizing the logistics to a certain degree themselves.

Direct selling

Only one farmer mentioned that he established direct links with local customers. In this case he is selling leafy greens to local restaurants and he is selling his products door to door [Ta7].

Similar to farm-gate selling, there are different forms of organization, where farmers sell together in groups. This ranges from groups organizing the logistics themselves to individuals who organize the logistics and charge the other farmers who participate for their services [Ta5, Ta7]. The main difference to farm-gate selling is, that the participating farmers are rewarded according to the prices they can get when selling on a remote market instead of a fixed price negotiated beforehand [Ta7].

Some are also buying additional products when they are not able to fill a truck themselves, and thus start mixing direct selling with a role as middlemen. If they do so, it might be performed in all variations mentioned previously [Ta5].

Roadside selling for certain products is common for farmers living close to the road, just keeping their products next to their houses in a small stand, selling what is harvested and available to passers-by [TaObservation].

Direct Links

The fruit-farmer cooperative UWAMATAM has established a direct link to a juice producing company in Dar es Salaam which they supply with produce from their group of 63 member (27 women) [TaUWAMATAM]. They prefer selling to the juice company as they can sell per weight, something they claim to be more profitable than selling per piece, the standard procedure on the local markets [TaUWAMATAM, Ta4]

A direct link with a danish NGO should be established for spices. For this UWAMATAM needs to get an organic certification for their products from TOAM. Currently the certification process is running. Unfortunately not even the chairmen of the cooperative could tell the name of the danish NGO [TaUWAMATAM].

MVIWATA tries to set up a new company called Kinota trading company that could be able to buy up much of the spices from local farmers [TaAneth, TaAisha]. Kinota is expected to buy up 60t of cinnamon, 23t of black pepper and cloves each as soon as running [TaAneth]. This company

is set up to bypass the local middlemen that are buying the spices in order to increase the profit of the local farmers [TaAneth, TaAisha].

There was once a cooperative available that was selling coffee from Tandai. This cooperative was regularly given premium prices due to the high quality of the coffee [Ta6]. Unfortunately this cooperative ceased to exist due to internal corruption issues and the farmers are now selling individually in small quantities to middlemen at Tandai market [Ta6]. MVIWATA also tries to find markets for these product [Ta6].

Some farmers produce goods in such quantities that they can fill a truck with products (i.e. bananas or sweet potatoes) to transport it to other markets. Products are preferably brought to Dar es Salaam or Dodoma due to the better prices.

Organic Markets

Local organic markets are not existing, and organic products do not make sense for the customers in this area. According to all interviewees, almost no one in the valley is using artificial fertilizers and pesticides. This leads to the situation, that all products from the area are considered “organic” by the locals. This makes it rather difficult for locals who produce with agroecological practices to claim a “specific quality” of their products [Ta1, Ta3, TaRichard].

SAT has a scheme running according to which they buy part of the production of their farmer groups to distribute it within their organic marketing network [Sat2]. To the disadvantage of farmers in Tandai, this network currently only needs very little [Sat1], and the transaction costs are rather high due to the distance to Morogoro. This makes products from Tandai farmers either more expensive for SAT, or less profitable for the farmers.

Discussion

General Farm-gate selling seems to bring more advantages to the farmers than selling on the local market. Maybe this is related to a different market structure available, as literature reporting negatively about farm-gate selling (see (IFAD 2003, Barrett 2008)) found market structures where a monopsony is in place, something that is not the case in Tandai, where the amount of traders is very high.

In this case, there was no difference between trained organic farmers and traditional organic farmers in regard to their market access perceivable. However, this does not mean that there was no difference between farmers perceivable. Generally the farmers can be split in two categories:

those who are mostly relying on farm-gate selling, sometimes with a very specific modus operandi, and those who rely on the self-organization of farmers to bring their products to specific markets.

The impossibility to differentiate the organic from non-organic products leads to a situation where there is locally no potential for farmers to sell these products by claiming a specific quality. Additionally, if outside traders are interested in products they can potentially sell as “natural” or “organic” they are aware of the fact that there are no pesticides and fertilizers used in the whole ward. Accordingly they have no need to get their products from certified organic farmers as long as these middlemen have the trust of their customers.

Market structure Considering the characteristics of nested markets, none of the farmers uses a market that could be considered “nested”. Still, there are some marketing channels that are potentially promising to be “upgraded” to a nested market or at least niche markets.

As the whole area is free of any pesticide use, the spices could be traded organically, also on local markets nearby. Maybe the initiative of SAT to set up an organic-only area at the Morogoro market could utilize these products.

Additionally the coffee that was formerly sold by the cooperative would have large potential to access specialized niche markets as organic coffee, and – should the claims of the coffee producers about the quality of Morogoro coffee be true – also in the premium segment.

Generally there is not so much potential for local nested markets, as the products are generally all considered to be organic, and as the governmental extension officer, the chairman, and the leader of the market board unanimously said that they try to educate people not to adopt the “bad practices” with which they meant pesticides and artificial fertilizers. One chance to really establish a nested local organic market is to refer to other qualities than the absence of artificial fertilizers and pesticides. There could be a strategy to create awareness for the benefits that come along with agroecological practices compared to traditional no-input farming. This could focus on the potential to increase the long-term fertility of the land, the decreased erosion and other aspects.

A.4 Farmers

Although the members of Karoleni and other farmers who got training in organic farming mention that organic farming is worth to be adopted as it is better for the environment and better for the health, their main incentive of adoption is the hope to increase yields [Ta1, Ta2, Ta3, Ta6, Ta7].

Organic methods like composting are mostly applied to vegetable production. From the interviewees none knew about methods to potentially increase the yield of staple crops by agroecologi-

cal means [Ta1, Ta2, Ta3, Ta6, Ta7]. Terracing is not practiced, although the slopes and the upland production of staples is widespread despite the low yields they obtain [Ta1, Ta2, Ta4, Ta5, Ta7]. Fallow periods are decreasing in the area due to smaller farm sizes that require more intensive utilization to meet demands (Ruheza and Khamis 2012). Other farmers mention that it is not worth to grow staples on the slopes and lease more distant plots in the lowland to grow these crops [Ta3, Ta6].

Organic perception

No fertilizers and no inputs with diversified production systems are default in Kinole. Thus, although agroecological practices can have beneficial effects for the environment, agroecological practices are mostly regarded as a way to increase productivity by sustainable intensification [TaKaroleni] or as a way to get access to new and different markets [TaUWAMATAM].

SAT promotes vegetable production in combination with agroecological practices through an incremental increase of cultivated area per farmer group over time and in regard to acquired skill-level [Sat1, TaUWAMATAM]. This enables the farmers to learn in a risk-free environment whilst deciding for themselves to adopt the practices. Vegetables extend the products of a farmer significantly and can give farmers good profits compared to staples. The farmers associate the actions of SAT with organic agriculture and hence attribute the positive impression SAT is making to organic agriculture in itself.

Marketing

Marketing is preferably done at the farm gate, but generally regarded as difficult [Ta1]. Mostly due to the high number of middlemen in the chain until the products arrive at those processing them or distributing them to retail, beating down the price [Ta1, Ta3, Ta5]. Even for local middlemen who sell in Dar es Salaam it can be challenging to make a profit [Ta5]. Further none of the middlemen is able to market the products as organic. The cooperative UWAMATAM is trying to surpass this problem by getting a certification to access potential organic markets with their spices [TaUWAMATAM]. But UWAMATAM also faces some risks, as the access to a specific market is not certain.

Market building

Local markets for organic products are an impossibility, as there are only “organic” products. This leads to the situation, that the only possibility for creating markets would be to claim another distin-

guished quality, something that is not done by any of the interviewed farmers. On the contrary, one interviewee referred to a farmer losing market shares because of his utilization of agrochemicals [Ta1], showing that organic product are already valued in the valley.

Market influence on crops

Spices are the default crops and are grown on a large scale. Many traders from Dar es Salaam and Zanzibar are in Kinole during the harvest season of spices, thus there are good marketing opportunities. Additionally there is a well established infrastructure for the drying and processing of spices.

Another locally important and widespread crop are pineapples that can be found on almost every farm, leading to large exports from the area. Coffee is restricted to certain sites where the micro-climate is favorable [Ta7].

B Mgeta ward, Nyandira and Langali village

B.1 Introduction

The case study in Nyandira and Langali was carried out during three days in the field. In the course of the study the following means of data collection were performed:

- 11 interviews with individual farmers [M1, ..., M11]
- a group interview with two farmer groups, called *MUpatachu* 1 and 2 [MUpatachu]
- an interview with an MVIWATA official [MMVIWATA]
- an interview with one of the chairmen of the local goat-milk cooperative [M10]
- observations including landscape readings, transect walks and informal talks to drivers [MObservation]

B.2 Location, Infrastructure and General Land Use Practices

Mgeta (lat -7.05655, lon 37.57693) ward is an upland ward in the south-west of Morogoro town. It is comprised of several villages, of which the villages of Langali (lat -7.05655, lon 37.57693) with 3000 inhabitants and Nyandira (lat -7.08414, lon 37.57623) with 5000 inhabitants were visited. The villages are located in the Uluguru mountains around 28km south-south-east of Morogoro (see figure 5). The landscape is hilly to mountainous. While the terrain in Langali is rather hilly it is extremely mountainous towards Nyandira [MObservation]. Nyandira itself is located in a small depression on a plateau, creating a hilly and less extreme terrain surrounding the village. Langali and Nyandira are lee-side of the mountain, thus they catch significantly less rain than the more eastward lying villages on the mountain slopes like Kenge and Tandai in Kinole. The upper parts of the ward still get a lot of precipitation due to rising air-masses that create convective precipitation events. The lower parts are very arid in the dry-season. Still, irrigation is widespread due to the high availability of waterways and sources [M6, M7, MObservation].

The distance to the nearby city of Morogoro is 45km, with short sections on bad dirt roads. The last part from Langali to Nyandira is an exceptionally steep and winding road, but it got a solid concrete top in 2009 and is easily passable for trucks, cars, and motorcycles. The road system from Morogoro is rather well maintained. Travel time from Morogoro to Langali averages at around 1 hour 30 minutes by car and motorcycle, 3 hours by truck, and an additional 15 to 30 minutes to Nyandira [MObservation]. The agricultural practices in the area are small scale with a high

utilization of terracing [MObservation]. The major staple crops are potatoes, maize, beans. The major cash crops are peas and cabbage, cauliflowers and tomatoes. But also sweet potatoes, taro, onions, carrots, bell peppers, spinach, lettuce, pak choi, amaranth greens and other leafy greens are grown. In regard to fruits, plums, peaches and apples dominate the area around Mgeta; avocados, bananas and papayas can be found in the lower altitudes [M1, ..., M11]. Some years ago a disease around Nyandira decimated the fruit trees, especially peaches and plums [M9].

Intercropping is a rather important practice as many farmers feel pressure on the available land and have to improve yields [M6, M7]. Very common in the flat areas are maize intercropped with beans; a frequent setup on terraces is one row of maize with one row of beans as trellis [M10]. But also other crops are intercropped; there is always a focus crop with others intercropped [M7]. Not all farmers apply intercropping [M8], although it can be observed on most of the fields in the flatter areas [MObservation]. Intercropping has become widespread due to the necessity for higher productivity which in turn is due to the rising amount of farmers and thus shrinking size of plots [MMVIWATA].

Almost all agricultural land in the upland is terraced [MObservation, M1, ..., M11]. The mountainous parts tend to have terraces on slopes up to 33 degrees and more [MObservation]. The utilization of artificial fertilizers and pesticides is widespread and recognized as best practice in the region [MUpatachu, M1, ..., M11]. From the eleven interviewees all were using fertilizers and only those who have a strong opinion in regard to pesticides [M5] or are not able to afford them refrain from usage [MUpatachu]. The interviewed organic farmers only dedicate a small part of their farm to purely organic cultivation (around one fifth), on the larger part of each farm conventional methods are used [M1, ..., M6].

The area is quite well developed in regard to livestock rearing. All the interviewed farmers had a piggery with one to ten pigs, most farmers having three to five [M1, ..., M11]. One farmer explained that pigs are considered as savings account that can be slaughtered when money is needed [M10]. Also the numbers of poultry are generally high. Another significant difference to other areas is the availability of milk-goats that were introduced by SUA in cooperation with NORAD in 1982 (Lie et al. 2012). Despite the assumption that the goats would not do well in tropical climate, they did very well in the Mgeta highlands, and as of now there are up to 2000 dairy goats in the Mgeta highlands [MMVIWATA].

There is a local goat-milk cooperative called *Tawosa*, that has 56 members and produces 200 liters of milk per day [M10] (other sources mention it were 68 members in 2011 (Lie et al. 2012)). The cooperative processes goat-milk to yogurt for the local market and would be able to increase

production easily if other markets were found. According to a board member of the cooperative, the local market is saturated and in order to export to other areas they would need a truck with cooling facilities that is not available [M10]. Still for the members, the cooperative is a reliable source of income, providing 1000TZS (0.43 € in 10/2016) per liter goat milk [M8, M10]. To maximize milk production oil-cake from sunflower-oil production and other non-local feed-concentrates are fed, but only some farmers adhere to this practice [M7].

B.3 Market Structure

There are two formalized markets in Mgeta that take place regularly [M4]. One is in Nyandira on the high-plateau, the other one is in Langali. Both markets are run by the local government, although Nyandira was initially set up by MVIWATA and Fert and run by a market board and is a much larger market than Langali [MUpatachu] (Okore 2014).

Langali Market

Langali market is a small local market with mostly local middlemen that transport the products to the surrounding larger markets. Besides, it is an important place for locals to get the products they need. Only few trucks and middlemen are active here, although it is directly on the way to Nyandira market. On the Langali market, the organic products are sold later than the non-organic ones due to their appearance and perceived lower quality [MUpatachu].

The price on the market can get very low, but as all the local middlemen pay the same prices and they do not have alternative marketing channels, farmers have not alternative to accepting the low prices [M1].

Nyandira Market

Nyandira market is a formalized general market that was set up by MVIWATA and FERT in 2003 (FERT and MVIWATA 2009, Okore 2014). The market was run by a private company (market board) until early 2016, when it was taken over by the local government, discarding the market board.

The market is formalized and offers several services to the buyers and sellers. These include short term storage for products, price information systems and toilet facilities [M11, MMVIWATA] (Okore 2014). The price information system is not working as intended according to the interviewed local farmers [M7, ..., M11, MMVIWATA]. Originally prices from major markets should

be displayed on the board to raise the prices for farmers, but instead the prices that the local middlemen paid during the last market day or the prices the traders are willing to pay are displayed [MMVIWATA, M9, M11]. Still, the formal character of Nyandira market has made selling easier for farmers compared to the unofficial markets that were held previously [M10]. Still, farmers from Langali value the price boards in Nyandira despite the price-formation issues, as they are still raising the prices slightly [M2]. Still many perceive the prices as artificially low [M8, M9].

The most important products sold on Nyandira market are vegetables (cabbage, tomatoes, green peas, beans, cauliflower, carrots, bell pepper, potatoes and leafy greens) and seasonally plums and peaches that are ready in December and January [M8, ..., M11] (Lie et al. 2012).

Some farmers from Langali bring the products to Nyandira, as they can get better prices [M1, M2], others do not do that as the transportation costs are consuming any price benefit that could potentially be gained in Nyandira [M3]. One farmer mentioned that Nyandira has better prices for avocados and that these are the only products he brings there [M6].

Farm gate selling

In Langali farm gate selling is difficult to organize as so many farmers are bringing their products to the market that there is no demand from middlemen to make contracts with farmers in advance [M2]. Still it would be the preferred method for selling the products.

In Nyandira, farm gate selling is quite common for cabbage. Farmers come to the market and negotiate with the middlemen to pick the products roadside [M7, M10].

Local Producers

The local goat-milk cooperative *Twawose* is an important link for the local milk-producers, especially as it creates a very short circuit from farmers to final customers who can acquire a value added product after two exchanges (farmer → processor → buyer). The milk-cooperative emerged from the goat-husbandry cooperative in 2007 and grew soon big enough to supply the local market (Lie et al. 2012). Over some years the cooperative was carried by supports from aid programs, especially one large donor who paid half of the price for yogurt in a school-nutrition program. Unfortunately the donor retreated after the government stopped paying the other half of the price (a demand of this organization), leaving the cooperative on its own in 2015. For an in-depth analysis of the value chain associated with Tawosa see Lie et al. (2012).

Direct Selling

Direct selling is especially important for the organic producers in Langali who created a special customer-base by selling their products to consumers who are valuing the specific product qualities [M1, ..., M6]. This is done by door-to-door selling where the farmers act as vendors themselves; additionally they sell on Langali market, where the customers know on which days the producers (who grow organically and conventionally) sell their organic products [M2, M3]. The demand for organic vegetables in Langali is quite high, and they are capable of selling almost everything as many people here are said to be aware of the detrimental effects of pesticide exposure on the health [M3].

Direct Links

One of the organic producers was approached by two businessmen (one local, one outsider) to provide organic products [M3]. She is delivering to them, but does not share the business contacts with her colleagues. When she is not capable of providing enough herself she stocks up with products from her colleagues [M3]. The middlemen order the products regularly from her, even before the products are planted, thus giving here a very secure contractual arrangement [M3].

There are thoughts of organizing the organic group better for selling, but so far these are only thoughts and nothing has materialized yet [M2]

There used to be an organic market in Dar es Salaam which they were selling to directly. But this market did not persist; they had access to this market when they started with organic practices, creating major distortion when it was shut down [M2].

Organic Markets

According to two farmers from Nyandira [M10, M11], there was no possibility to create a local organic market in Nyandira. Both farmers produced a lot of organic products for some time, but had to quit due to a lack of marketing channels. According to them, it is difficult to sell to farmers who are producing the same products themselves [M10]. Even after raising awareness, the corresponding farmers did not start buying organic vegetables, but rather changed their practices for crops designated for domestic consumption to organic [M10].

The organic producers from Langali may have the option to send some products to SAT in Morogoro, but the amounts are very limited and do not contribute significantly to their marketing capabilities [MU^{patachu}]. This option is not available for the organic farmers in Nyandira

who were trained by MVIWATA, and have switched back to conventional farming completely [M10, M11].

B.4 Farmers

Two farmer groups of organic producers with a total of 33 members and 11 individual farmers were interviewed on their detailed practices, the crops they produce, their farming systems, marketing possibilities, and marketing strategies.

Six of the farmers are from Langali village and are currently organized in the group Upatachu [M1, ..., M6]. All of these have certain parts of their farm dedicated to organic agriculture. The other farmers are from nearby Nyandira and are using fertilizers and pesticides on their whole farm (except certain areas for domestic consumption) [M6, ..., M11]. Two of these farmers were trained in organic farming and were producing organically for some time, but switched back to conventional farming due to marketing issues [M10, M11].

All the farmers have access to irrigation – at least on parts of their farm [M1, ..., M11]. With irrigation it is possible to have three vegetable harvests a year [M4].

Organic perception

The organic farmers from Langali perceive organic farming as more profitable as they do not have to buy expensive inputs but can rather rely on organic fertilizers and on organic pesticides [M5]. They would all extend the area they are growing organically but point out a lack of manure for fertilization as the main reason why they do not expand. The benefits for the environment and health are acknowledged, but saving the costs for inputs is one of the incentives that is stated as being most important [M5, MUpatachu]. This is confirmed by the fact that farmers were leaving the organic production group when SAT did not provide the promised facilities as quickly as expected by the farmers, showing a high interest in direct benefits, training and payments but less in the beneficial long-term effects. Interestingly, none of the organic farmers are using intercropping [MUpatachu, M1, ..., M6], while it is quite common for the conventional farmers in Nyandira [M7, MMVIWATA].

Marketing

Instead, most organic farmers mention the saving of agrochemical purchases as the most worthwhile feature of organic production. Marketing is perceived as rather difficult, especially if they

want to claim the organic quality of the products. This only works on local markets that were built specifically (see next section), or in rare cases by selling to businessmen who have a demand for organic products.

Market building

Market building has worked to a certain degree in Langali, but proved to be difficult in Nyandira. In Langali, the members of Upatachu are often selling directly to customers on the market or door-to-door, claiming their specific product quality [MUpatachu, M1, M2, M3, M4, M5]. This market is established and works for several years now. All the interviewed farmers who started selling door-to-door continued with it and claim that they can sell their products faster than other vendors the non-organic products, leading to a higher market-share.

On the other hand, the farmers that started selling organic products in Nyandira could not establish a market, allegedly because supply decreased when buyers interested in organic products started to cultivate their plot for home-consumption organically themselves.

It has to be mentioned that the initial conditions for the farmers in Nyandira and Langali were rather different. While the introduction of organic practices in Langali was done slowly, partially expanding the organically cultivated area, it was done at once in Nyandira [MUpatachu, M10, M11].

In Langali the farmers developed from a training-plot, where the whole group was growing together, to plots cultivated by smaller groups until individuals started growing themselves, still dedicating only a minor part of their farm to organic production [MUpatachu]. This allows the farmers to adjust the available area they have under organic schemes in regard to demand and manure availability. Scaling up has to be planned carefully as they cannot change back and forth from organic to conventional production due to a transition period of three years from a formerly conventional plot to an organic plot [M4]. The latter would prevent organic certification that many farmers wish to get.

In Nyandira the farmers changed their whole production to organic after receiving training with the promise that there would be a market for their products available when these were ready [M10]. This was not the case, leaving the farmer with large amounts of products that could not be sold as organic products [M10, M11].

To summarize, in Langali the local market for organic vegetables was built over years by farmers who sell also some of their conventional vegetables directly, by increasing their portfolio with organic products and educating the customers about it; in the second case, however, a lot of prod-

ucts needed to be sold immediately, leaving no time to build up a working local organic market. There, in Nyandira, the frustration that built up during the experiment was so high that the farmers switched back to conventional after one year [M10].

SAT is not an option for the farmers as they are just too remote from Morogoro. The transaction costs without higher prices would eat up much of the revenues of the products.

Market influence on crop choice

Mgeta is a vegetable growing region with a focus on cabbage, cauliflower, tomatoes, and potatoes. This is also reflected in the organic products that are similar. There are plenty of buyers and traders available for these products and they have a long tradition in the area.

Discussion and Conclusions

There is no default-market available for organic products. Accordingly, agroecological farmers do generally not perform better in the market than non-organic producers. It is likely that all-organic farmers would perform worse than conventional or conventional/organic farmers if they had to rely on the conventional market infrastructure due to the disadvantages when competing on the general markets adhering to the conventional definition of quality.

The local market where farmers can sell their products with a higher market-share (although the same prices) is a chance to secure income, but this cannot be the default growth concept for the organic agricultural sector as a rising supply would soon surpass demand, canceling out the positive effects from saved input-costs when more of the products have to be sold on the general market at lower prices.

In the rare cases where farmers have access to other marketing channels this is actually attributable to the specific product quality, as not the farmer established the contact, but the buyers who knew about the farmers practices.

The lack of default marketing channels for organic products led to an abandonment of organic practices by farmers in Nyandira. They switched back to conventional farming practices as they were not able to compete on the local market. Thus available markets can have a large effect on the applied cropping practices. Vice versa, it is likely that farmers will only change cropping practices if the resulting products can be marketed. Either these markets have to be available or the producing farmers must be confident that they can build them.

C Kenge village

The case study in Kenge was carried out during one day in the field. In the course of the study the following means of data collection were performed:

- 4 interviews with individual farmers (all organic)
- a group interview with an agroecological farming group
- landscape reading to determine the general agricultural landscape and type of agriculture
- a transect walk through agricultural land

C.1 Location, infrastructure and general land use practices

Kenge (lat -6.86973, lon 37.79779) lies at 950 asl [KObservation]. It is close to Soweto, about one hour walk uphill (see figure 5).

The climate in Kenge is generally cooler than in the surrounding area due to the high altitude [KObservation]. Still it is a typical savanna climate with two rainy seasons and a long dry season. During the long dry season there can be occasional rains due to convection of rising air masses at the hillside. The rains in the dry season are not sufficient for significant agricultural production.

The village can only be reached by foot, accordingly all agricultural products leaving the village have to be carried down the hill [KObservation, KKengeGroup]. The chairwoman does not know how many people are living in the mountain, her guess is less than 1000, but more than 500 [KKengeGroup]. There is not centralized village, rather the dwellings are distributed over the slope of the mountain, but there is a central meeting place with a dispensary that was funded by the local saving bank that also started to engage in organic agriculture [KKengeGroup]. Further, there is a small space for informal marketing at a football field close to the dispensary [KKengeGroup, KObservation].

The closest and actually only viable market is Soweto market in the valley, for an experienced carrier 30 minutes downhill from, and 40 minutes uphill to the dispensary. To there it can take the same time from the individual farms. Another potentially reachable market is Tandai market in Kinole, a 3 hour walk for an experienced carrier [KKengeGroup]. The latter market is too far away and is never used by people closer to Soweto, but sometimes by people who live closer in the direction of Kinole [K3]. The transportation cost to Soweto amounts to 6000 to 8000 TZS per 50kg if a carrier is hired [K4].

The distance to the nearby city of Morogoro is 15km on dirt roads, from which all are in relatively good condition. The average time needed to go from Morogoro to Soweto in dry season is about 30 minutes by car and motorcycle, longer by truck [KObservation].

The agricultural practices in the area are no-input small scale shifting agriculture with short fallow periods and upland cultivation of mostly maize, rice and beans as staples [KObservation, KKengeGroup, K1, K2, K3, K4]. The fallows used to be long, as long as it took until the land was fully recovered, but the increased population forced the inhabitants to reduce the length of fallow periods; this was perceivable in decreased yields one decade ago [K1, K4]. Nowadays, fallow periods are said to be a maximum of 5 years, accordingly yields for most upland cultivated maize and rice are decreasing [K1, K4]. The interviewees are reporting decreasing yields but are unaware of the causes [K1, K3]

The main products of the area are rice, maize, and beans; ginger is the most important cash crop [KKengeGroup, K1, K2, K3]. Recently Sustainable Agriculture Tanzania (SAT) introduced vegetables that were not grown previously; instead, wild vegetables were gathered in the mountain [Sat1, Sat2, K3]. The newly introduced vegetables are primarily tomatoes, pak-choi, carrots and spinach [K1, K2, K3, K4]. Some other farmers bought seeds themselves for a wider variety of vegetables [K3, K4]. Additionally, there are many banana groves, some spices and coffee, similar to nearby Kinole, but on a much smaller scale and less frequently observable [KObservation]. The interviewed farmers stated that they specialized on ginger in this area and are thus not growing so many spices and coffee [K1].

On the whole mountain no artificial fertilizers and no pesticides are used, mostly as the inputs are too expensive and not readily available; there is little livestock rearing on the mountains, only some poultry is owned by most of the farmers, also goats are held frequently. [KKengeGroup, K1, K2, K3, K4, Sat1, Sat2].

Most farmers cultivate a second farm in the lowlands where they are producing maize, millet, sesame and rice for selling. The farmers leave in December to go there to use the rains to work on these farms until the dry season when they come back to the upland area [K3, K4]. This arrangement contributes significantly to the family incomes of the interviewed farmers.

C.2 Market Structure

Soweto Market

Soweto market is the closest market that can be reached from Kenge. It is a market run by the local government. Mostly local middlemen are buying products to transport them to Mkuyuni market or Morogoro market to resell them. It is the only possibility for many farmers to sell beans, bananas and vegetables. A lack of farm-gate alternatives and other marketing channels forces them to bring their products to Soweto market, although it can happen, that the transportation costs to the market are higher than the prices they get for the product [K4].

At Soweto market conventional vegetables are sold, leading to the situation that the organic vegetables of the Kenge group have to compete with those, as well as the products of another organic group in the valley [K4].

Farm gate selling

Generally, farm gate selling is done for ginger that is currently the most important cash-crop besides beans.

The most frequent setup is that the buyers inform the farmers how much they want to buy, and the farmers have to organize the logistics to bring the products down the valley, although in some cases the buyers are sometimes organizing the logistics but pay significantly less to the farmers [K1] (instead of earning 67000 TSH for 50kg when transporting it down the valley themselves, they earn 55000 TSH when the buyer organizes the logistics). The farmers are not selling together, each farmer takes care of their business individually, as they have so much ginger that each one can fill whole trucks [K2, K3]. Although the farmers claim that their ginger is special in its taste and quality and the buyers appreciate that, they don't think their products are treated differently.

Direct selling

Direct selling for vegetables takes place close to the dispensary [K2]. But the demand is not high enough and the number of producers and their cultivated area is rising; on top, people not in the organic group started to grow vegetables for self-consumption [K1, K2]. While they were still producing as a group they could sell all their products locally, but now with several subgroups, the amount of produce will be much higher, and they are sure that the local market does not have enough demand for that [K1, ..., K4].

Some people started to sell the products door-to-door, trying to increase the volume of the market as well as the share they have in it[K2].

Direct links

Except the connection to SAT, none of the farmers mentioned any direct links.

Organic Markets

SAT is the only possible market-channel for organic products from the area. The farmers claim they have a contract with SAT and that SAT will take their products as soon as they are ready [K1].

C.3 Farmers

Four individual farmers and one farmer group with 27 members were interviewed on their detailed practices, crops they produce, farming systems, marketing possibilities and marketing strategies. The farmers were all traditional, small scale farmers who have been receiving training to apply agroecological methods for 18 months.

The organic agriculture group is producing together on an experimental plot. They also have four subgroups that are producing vegetables together. The whole group was interviewed as well as one individual from each subgroup.

Three of the four interviewees have a second farm in the valley [K1, K2, K3]. They also mentioned that almost everyone on the mountain either leases or buys land in the lowland to produce grain and pulses during the long rainy season from December to May [K4], adding substantially to the household income [K3]. The lowland farms have similar practices like the upland farms with prevailing no-input shifting-agriculture systems with short fallow periods.

Organic perception

The organic training, which comprises of building terraces, making compost, using animal manure, irrigation, applying crop rotations and brewing natural pesticides is generally regarded as introducing useful concepts and practices [KKengeGroup, K1].

It is believed that it could bring fertility to the fields that have low productivity [K1]. Vegetables are cultivated on plots where there is access to irrigation, adding two additional cropping cycles [K1]. The usage of compost and manure as fertilizers allows the continuous usage of a plot, increasing the yield per unit time even more [K1].

As SAT additionally promises to buy the grown vegetables, the organic practices come in a “package”, similar to positive effects that are promised by many outgrower schemes [KKengeGroup]. Knowledge, inputs and market-access is provided together. This makes the production very promising for participating farmers and they trust that SAT stands up to their promise [K1].

Marketing

Marketing is generally viewed as difficult. The most important commodity is ginger that is said to sell quite well [KKengeGroup], but still there are sometimes difficulties: The price is volatile, and finding buyers who pay a fair price is difficult at certain times of the year [K2].

For vegetables there are currently only two channels available. One is the local marketing that is done by the whole group and also by the subgroups [KKengeGroup, K1, K2, K3, K4]. But all farmers claim that the supply is much higher than the limited demand, especially as many other farmers who used to buy from them started to copy them [K1]. The other prospective marketing channel is SAT who made a contract with them to buy the products [Sat2]. In the aftermath of this case-study the delivery from the farmers to SAT started.

The third possibility to sell vegetables is to sell at Soweto market, but the farmers do not do that, as there is high competition and they think they can neither compete with the other organic production group in the valley nor the conventional vegetable farmers producing there [K1, K2].

For all other commodities Soweto market is used. Selling products is always done via middlemen who dictate the price; there is barely the possibility to negotiate anything [K4]. Additionally the middlemen never have any knowledge about organic products and they do not have demand for it [K4].

Market building

The farmers tried to build a market for the newly introduced vegetables themselves [KKengeGroup]. This worked well in the first year, when they could sell all the produce of the group. In the current season it proves more difficult as there is higher supply and lower demand. Supply rose as the groups split in four production groups who produce their own vegetables adding to the group’s production [KKengeGroup, K1]. Demand decreased, as many farmers started to have their own plots on which they grow vegetables for self-consumption [K1].

Otherwise they rely on SAT to build markets for them, as they are aware that they lack the necessary competencies to find markets other than the available market in Soweto, which they deem collectively as unsuitable for their vegetables [K1].

On asking whether they could market the specific organic quality of the products the response was that they never thought of it and that this could be a possibility [K3].

Market influence on crop choice

Ginger traders know, that they can get ginger in the Kenge area [KKengeGroup, K1]. This makes the cultivation of ginger more attractive to farmers in the first place, as they know that there is a potential market which can be utilized [K1].

Discussion and Conclusion

In regard to market performance the differences between organic and non-organic farmers are the different products (vegetables) they are producing and the selling contract with SAT buying these products. These vegetables provide the farmers with an additional income source from products that are normally not cultivated in the area. Generally this enables the organic farmers to diversify their production, yet they perceive a certain risk that they might not be able to sell the products if SAT is not buying it.

One of the most important aspects of the farmers' well-being are the additional much larger farms they have in the lowlands that contribute significantly to their income.

There is indication that the available markets influence the cropping decisions to a large degree. The traditional place of ginger in the cropping cycle of local farmers is self-reproducing from a cultural perspective, from tradition, but also from a market perspective, as middlemen come to Kenge specifically for its ginger. Vegetables were only grown in small quantities the first year and only increased in the second year as SAT created a demand for the products by offering a buying contract.

Local market building is difficult due to the negative feedback the introduction and marketing of a certain foodstuff (vegetables in this case) have. As the farmers have similar resources and practices, for most farmers it is easy to adopt the practices to grow vegetables instead of buying them on the market, thus decreasing the demand after an initial growth. This is even exacerbated if the new producers grow in such large amounts that they start selling themselves.

D Ruvuma village, Morogoro town

D.1 Introduction

The case study in Ruvuma was carried out during two days in the field. In the course of the study the following means of data collection were performed:

- 4 interviews with individual farmers (all organic)
- two group interviews with an agroecological farming group, notably the chairmen of the groups and the division chairs for animal husbandry, vegetable production and livestock rearing.
- landscape reading to determine the general agricultural landscape and type of agriculture

D.2 Location, infrastructure and general land use practices

Ruvuma (lat -6.87021, lon 37.66063) is an uphill village close to Morogoro town (see figure 5). It averages at 800 m asl. Motorcycles and cars can pass there, although cars need an above than average ride height. There is a small agglomeration of housings, the rest is distributed over the mountain. The closest market is Morogoro market in the valley, 15 minutes by motorcycle. Motorcycle is the preferred means of transport for people and goods [RRuvumaGroup]. There is a small informal local market to exchange goods [RRuvumaGroup].

The agricultural practices in the area are upland maize/bean cultivation with occasional cassava and taro plantations as well as banana groves [RObservation, R1, ... , R4]. The economically most important crops are vegetables which are all – except cabbage – grown under irrigation schemes, strawberries and some fruit (mostly banana and papaya) [Sat1, R1, ... , R4]. Upland maize farming is done on the same plot for some consecutive seasons. When yields get too low the plot is turned to fallow [R1]. Fallow periods do not exceed 3 to 5 years [R2]. Recently (from 2010) agroecological practices were introduced by SAT, most notably terracing, crop rotation, mulching, composting and plant extracts for natural pest control [Sat1, RRuvumaGroup]. No new varieties of crops were introduced as vegetable production has a long tradition in Ruvuma [Sat1, RRuvumaGroup, R3]. These practices are now spread among the farmers population by the pioneering groups, and agroecological practices become more widespread [RRuvumaGroup, R2, R4]. This is most obvious in the creation of new terraces which were introduced as a soil protection measure for the farmers by SAT [Sat1, RObservation]. The water availability on the mountain is very good. There are already large parts of the hillside irrigated, with a planned increase of irrigated areas, but this has to be

accompanied by further infrastructure investment, as all the area with potential for open channel irrigation is already used [RRuvumaGroup, R4, RObservation].

The use of artificial fertilizers and pesticides is quite common for those farmers who are economically able to purchase them [RRuvumaGroup, R1, R4].

Animal husbandry is uncommon, but at least the organic groups acknowledge the need for it and have the vision to expand animal rearing on the slope, especially with cattle herding. Although there are recent attempts to introduce more cattle and rabbits [RRuvumaGroup, Sat1], still most farmers do not have much livestock, especially not enough to produce the needed manure. Most common animals are goats (a Swiss milk-goat breed from the Haifa project) and poultry [Sat1, R2]. Livestock is also one of the limitations for organic agriculture, as the availability of manure for fertilization is very limited [RRuvumaGroup]. Compost making with wild-gathered plant materials is best practice for the agroecological farmers [R1, ... , R4].

D.3 Market Structure

Morogoro Market

Morogoro market is a larger local market where all kinds of agricultural products are traded [R1, ... , R4]. Organic products sold at Morogoro market lose their specific product quality [R1, ... , R4]. What is more, they may even suffer a disadvantage in competition due to their appearance, receiving lower prices at times [R1, ... , R4].

SAT has an initiative running to set up a specific area at Morogoro market to allow the distinguishability of organic products [R1].

Farm gate selling

The local strawberry production is shipped away by local businessmen who bring it to Dar es Salaam or Zanzibar directly [R1, ... , R4]. The certified farmers are all selling their products to these middlemen, but the middlemen do not treat the products differently or look for a specific market [R1, ... , R4].

Direct selling

Only one of the farmers is selling directly to customers in Ruvuma and getting a higher market share for his organic products [R4]. For the others, everything is done via middlemen or business

partners [R1, ... , R4]. Their stance is that farmers cultivate the land and not markets; markets are perceived as complicated and people who have the knowledge should handle these issues [R4].

Direct Links

There are direct links to buyers from Bagamoyo and Dar es Salaam available that are actually increasing the income of the farmers as up to double the price. One of the farmers (R4) is selling carrots to a direct buyer who is exporting them to other countries of the East African Community as organic products [Sat1, R4]. He also has contract middlemen who buy large amounts of beet-root to Bagamoyo, keeping the organic product quality [R4]. All these contacts were made by attending trade fairs (mostly the Nane Nane shows that are accompanying the celebrations of the public holiday on 8th of August, the farmers' day, every year) [R4].

There is the potential to push the strawberry group to sell specifically organic strawberries to Dar es Salaam and Tanzania, but currently the organization is not planning any expansion in this direction [R2].

Organic Markets

The farmers from Ruvuma are the main suppliers for the organic shop in Morogoro run by SAT as well as the distribution network SAT is currently setting up [Sat1, Sat2]. Currently SAT is only buying a very small amount of the production of the farmer groups as the network is still in its early stages [RRuvumaGroup].

Organic local farmers have contacts to “trusted” middlemen who are buying organic products in order to sell them in the upper-class areas to customers who value organic products [R1, ... , R3]. These trusted middlemen buy regularly and reliably products and can sell them sometimes for higher prices to customers in the upper-class area [R1, ... , R3]. The group-name of the organic group, and even more so the name of the chair of SAT act as a trademark that promises organic production and quality and is used by the middlemen who sell in the upper-class area [R1, ... , R3]. But there also have been occasions of fraud, where middlemen were selling non-organic products fraudulently labeled as products from the organic group [R2].

D.4 Farmers

Four farmers were interviewed on their detailed practices, the crops they produce, and farming systems. The interviewed farmers were all certified organic farmers with a variety of products. They switched to organic farming in 2010 and got certified in 2013 [Sat1, RRuvumaGroup].

The farm-size ranges from 0.8 to 2 hectares, with 0.2 to 0.6 hectares dedicated for vegetable production [R1, ... , R4]. According to the farmers, this is in the average range of farm sizes on the hillside [RRuvumaGroup].

The farmers were given a theoretical and practical training in agroecological methods by SAT beginning in 2010. The certification followed in 2013 [Sat1, RRuvumaGroup].

No artificial or mineral fertilizers and agrochemicals are used [R1, ... , R4]. Only local inputs are used. Manure is not brought on farm from conventional farms to ensure organic production, rather livestock is raised organically to ensure quality standards, although there is currently no market for organic dairy or meat products [RRuvumaGroup, R1]. Compost is made from locally available material [Sat1, R1, ... , R4].

For the staple production monocultures of maize, cassava and taro are used [R1 to R4, RRuvumaGroup]. Crop rotation with legumes and recently the planting of leguminous trees is used to increase fertility on the fields [Sat1, RObservation]. The latter is also done to prevent soil erosion [R1]. Intercropping for staples is not done [R1, ... , R4].

Organic perception

All the farmers reported, that they gained economically since taking up organic farming [R1, ... , R4, RRuvumaGroup]. They generally assume that organic farming is more profitable for them. This is attributed to an increase in yields accompanied by less expenses for inputs [R3]. None of the farmers assumes that they have lower yields since turning organic, although they were using fertilizers before the transition [R1, ... , R4]. Only in the first seasons after terracing normally a slight decrease in yields is perceivable [Sat3]. That yields are not falling is attributed to the bad condition in which the soil was before cultivating organically [R4]. The farmers are convinced that organic production is the right thing to do for the environment and for the farmers and are actively engaging in disseminating knowledge about agroecological practices to other farmers [RRuvumaGroup]. In their perception degraded and eroded land quickly became more fertile and is still getting better by the utilization of agroecological practices [RRuvumaGroup, R4].

Marketing

Some farmers have direct connections to buyers in the major urban centers of Tanzania and in Kenya [RRuvumaGroup, R4]. This is made possible by the certification with the Participatory Guarantee System of East Africa issued by TOAM that is recognized in the whole East African Community. These connections are partly attributable to the organic certification, but also to the

proactive engagement of the farmers who acquired these contacts by participating in exhibitions on trade fairs [R4]. The prices for these products can, when sold organically, be up to twice what they get on the local market [R4, RRuvumaGroup], but the group is also selling their products to non-organic conditions at times [R4]. The production of organic vegetables is tightly coupled with demand: they have a lot of growth potential, but as long as they cannot sell it, they will not produce it [RRuvumaGroup].

The group is well organized and is currently trying to scale up to get the necessary quantities to enter the export market [RRuvumaGroup]. To access European and other Western markets a certification by TanCert is necessary, something they see as easily achievable [RRuvumaGroup].

The acquisition of goods by SAT is as of now relatively irrelevant for the farmers group. SAT buys products, but only little [RRuvumaGroup]. For the group members this is natural, as SAT is mostly about training and practice, and not about marketing and selling. Although they hope that the initiative of SAT for a regional distribution network for organic products, as well as the initiative to get an all organic subsection at the Morogoro market in the future, will be successful and will stimulate the amount of products that either SAT can purchase directly for their distribution network, or that can be sold as organic on the Morogoro market [Sat1, RRuvumaGroup].

Market building

The farmers do not engage in selling the products themselves [R1, ... , R4]. For a local market that focuses on organic products they collaborate with some trusted middlemen who sell the products door-to-door in the upper-class neighborhoods of Morogoro [R1, ... , R3]. The organic products are well received in these areas. The success of these middlemen is based on the good reputation of SAT and its CEOs Janet Maro and Alex Wostry who enjoy an excellent reputation. The middlemen use these names with a lot of success to sell their products.

SAT is engaging strongly in setting up a local distribution network for organic products [Sat1]. Currently it has an organic shop running (across the street of Tushkamane center in Morogoro). Additionally it aims at supplying hotels and building a specific area for organic products at Morogoro market [Sat2]. This is not done by the farmers from Ruvuma themselves, but since they are very close to Morogoro, these initiatives benefit them in the first and foremost due to their proximity and the low transaction cost to access the newly established infrastructures.

An unused chance is the direct link to Dar es Salaam and Tanzania with the strawberries. The organic farmers are producing organic strawberries and have the certification, but the products get mixed up in the process of collection and lose their specific value. Due to the large tourist market

and the large expat population in Dar es Salaam there is most likely a market in Dar es Salaam and Zanzibar for these kind of products.

Market influence on crop choice

The area is known for its strawberry production [RRuvumaGroup, Oyst]. Climatically it would be possible to produce strawberries in the other visited villages, but they are not produced. The middlemen know there are strawberries available in Ruvuma and buy them there for transport to Dar es Salaam or Zanzibar [R1, ... , R4].

Discussion and Conclusions

The organic farmers in Ruvuma do very well economically. This may be influenced by several factors. Firstly, they are first movers, thus are interested in innovation and are accordingly very active in the acquisition of business links. Secondly, they regained fertility by applying organic practices, and claim to have increasing yields, despite abandonment of agrochemicals. Thirdly, they can sell their organic products sometimes for higher prices, generating comparably large margins of profit.

Thus parts of their economic well-being are potentially unrelated to their organic farming practices. On the contrary, it might be that they are actually pursuing organic practices because of their entrepreneurial capabilities as they tried to harness the potential benefits of organic agriculture to develop their farms. R4, as the obviously most successful farmer is actually selling large parts of his products non-organically (as the buyers are not interested in the specific quality of the product); he attributes his economic success to his engagement in trade fairs, where he created viable business links with traders from Dar es Salaam and Bagamoyo [R4].

On the other hand, others who are less engaged in building personal business links are benefiting a lot from their organic products, as they have the capability of selling directly to customers and also to sell certified organic products to markets that are further away and where “trust” in the product can more easily be created by a formalized certification than by the mere word of the seller. This holds true especially in settings where the products are changing hands several times, and the transaction are more anonymous between the different actors in the market.

E Case Study Database

1. **TOAM1**: CEO, Tanzanian Organic Agriculture Movement, 2016-06-07, Dar es Salaam
2. **TOAM2**: Programm Coordinator, Tanzanian Organic Agriculture Movement, 2016-06-07, Dar es Salaam
3. **Sat1**: Marketing Officer, Sustainable Agriculture Tanzania, 2016-06-17, Morogoro
4. **Sat2**: Marketing Officer, Sustainable Agriculture Tanzania, 2016-08-28, Morogoro
5. **Sat3**: Financial Manager, Sustainable Agriculture Tanzania, 2016-06-20, Morogoro
6. **Oyst**: Dar es Salaam – Oyster Bay Market, observation and interview
7. **MVIWATA1**: Team Leader Economic Empowerment Unit, MVIWATA, 2016-06-15, Dar es Salaam
8. **RObservation**: Ruvuma, observation
9. **RRuvumaGroup**: Board members, SAT Group Ruvuma, 2016-09-09, Ruvuma
10. **R1**: farmer, female, SAT Group Ruvuma, 2016-09-09, Ruvuma
11. **R2**: farmer, female, SAT Group Ruvuma, 2016-09-09, Ruvuma
12. **R3**: farmer, female, SAT Group Ruvuma, 2016-09-09, Ruvuma
13. **R4**: farmer, male, SAT Group Ruvuma, 2016-09-09, Ruvuma
14. **KObservation**: Ruvuma, observation
15. **KKengeGroup**: whole groups, SAT Group Kenge, 2016-09-08, Kenge
16. **K1**: farmer, female, SAT Group Kenge, 2016-09-08, Kenge
17. **K2**: farmer, female, SAT Group Kenge, 2016-09-08, Kenge
18. **K3**: farmer, female, SAT Group Kenge, 2016-09-08, Kenge
19. **K4**: farmer, female, SAT Group Kenge, 2016-09-08, Kenge
20. **MObservation**: Mgeta, observation
21. **MMVIWATA**: field officer, male, MVIWATA, 2016-09-07, Mgeta (Nyandira)

22. **MUpatachu**: whole group, SAT Group Langali, 2016-09-06, Mgeta (Langali)
23. **M1**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
24. **M2**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
25. **M3**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
26. **M4**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
27. **M5**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
28. **M6**: farmer, female, SAT Group Langali, 2016-09-06, Mgeta (Langali)
29. **M7**: farmer, female, no group, 2016-09-07, Mgeta (Nyandira)
30. **M8**: farmer, female, no group, 2016-09-07, Mgeta (Nyandira)
31. **M9**: farmer, female, no group, 2016-09-07, Mgeta (Nyandira)
32. **M10**: farmer, male, MVIWATA, 2016-09-07, Mgeta (Nyandira)
33. **M11**: farmer, male, MVIWATA, 2016-09-07, Mgeta (Nyandira)
34. **Ta1**: farmer, female, SAT Group Tandai, 2016-08-31, Tandai
35. **Ta2**: farmer, female, SAT Group Tandai, 2016-08-31, Tandai
36. **Ta3**: farmer, male, SAT Group Tandai, 2016-08-31, Tandai
37. **Ta4**: farmer, male, MVIWATA member, 2016-09-02, Tandai
38. **Ta5**: farmer, male, no group, 2016-09-02, Tandai
39. **Ta6**: farmer, male, no group, 2016-09-02, Tandai
40. **Ta7**: farmer, male, no group, 2016-09-02, Tandai
41. **TaAneth**: field officer, female, MVIWATA, 2016-09-02, Tandai
42. **TaAisha**: CEO, female, Market Board, 2016-09-02, Tandai
43. **TaRichard**: extension officer, male, Government, 2016-09-02, Tandai
44. **TaObservation**: Tandai, observation

45. **TaUWAMATAM:** board members, UWAMATAM, 2016-09-02, Tandai

46. **TaKaroleni:** whole group, Karoleni – SAT Group Tandai, 2016-08-31, Tandai



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