

Improving Small-Scale Farmer Households' Livelihoods Through Participation in a Development Project and Conversion to Organic Agriculture

A Case Study of Zanzibar, Tanzania

Laurine Schønning Kjærulff (qnk940)
BSc Project, Geography and Geoinformatics, block 3-4, 2018
University of Copenhagen

Supervisor: Torben Birch-Thomsen
Company: Organic Denmark
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Table of Contents

Acronyms	2
Abstract	2
Acknowledgements	3
Introduction and research questions	4
1. Background for research	7
2. Theoretical framework	8
2.1 <i>Development context</i>	8
2.2 <i>Traditional, organic and conventional agriculture</i>	10
2.3 <i>Rural transformation in Sub-Saharan Africa</i>	12
2.4 <i>Sustainable Livelihoods Framework</i>	13
2.5 <i>Participation in agricultural and rural development</i>	15
3. Methods	18
3.1 <i>Questionnaires</i>	18
3.2 <i>Sample's representativity of population</i>	19
3.3 <i>Interviews</i>	20
3.4 <i>Challenges to my first research question</i>	22
4. Study area: Zanzibar, Tanzania	23
5. Results and analysis	27
5.1 <i>Case area</i>	27
5.2 <i>Overview of households</i>	29
5.3 <i>Household groups 2015</i>	30
5.3.1 <i>Socioeconomic characteristics of the household groups in 2015</i>	31
5.4 <i>The household's socioeconomic changes from 2015 to 2017</i>	39
5.4.1 <i>Increased incomes and a change in marketing methods</i>	40
5.4.2 <i>Increased yields and organic farming practice</i>	45
5.4.3 <i>Increased social activities</i>	48
5.4.4 <i>The socioeconomic changes addressed in a Sustainable Livelihoods Framework</i>	49
5.4.5 <i>Partial conclusion to the socioeconomic changes</i>	51
5.5 <i>Participation in the project</i>	52
6. Discussion	54
6.1 <i>Reasons for the socioeconomic changes from 2015 to 2017</i>	54
6.2 <i>Reasons for the participation in the project and its correlation to the socioeconomic changes</i>	57
6.3 <i>Perspectives on my research</i>	58
Conclusion	60
Bibliography	62
Appendices	66
A. <i>Questionnaire</i>	66
B. <i>Interview guide: Semi-structured interviews with farmer household representatives</i>	69
C. <i>Interview summaries</i>	73
C1. <i>Bisambe Kombo Nasuha</i>	73
C2. <i>Mpaji Abdallah</i>	74
C3. <i>Mariam Ferouz</i>	75
C4. <i>Sharifa Saidi</i>	76
C5. <i>Mohammad Iddy Mohammad</i>	77
C6. <i>Khamis Ramadhan Zam</i>	78
D. <i>Chi-squared tests: Sample's representativity of population</i>	79
E. <i>Percentage increase/decrease of total household income from 2015 to 2017</i>	83

Acronyms

CA	Conventional Agriculture
DFID	Department of International Development
FAO	Food and Agriculture Organization of the United Nations
FFLG	Farmer Family Learning Group
FHR	Farmer Household Representative
FiBL	Research Institute of Organic Agriculture
GDP	Gross Domestic Product
GR	Green Revolution
HIG	High-Income Group
IFAD	International Fund for Agricultural Development
IFOAM	International Federation Of Organic Agriculture Movement
ITK	Indigenous Technical Knowledge
LIG	Low-Income Group
MIG	Middle-Income Group
OA	Organic Agriculture
OD	Organic Denmark
RGoZ	The Revolutionary Government of Zanzibar
RIPAT	Rural Initiatives for Participatory Agricultural Transformation
SLF	Sustainable Livelihoods Framework
SSA	Sub-Saharan Africa
TA	Traditional Agriculture
TOAM	Tanzania Organic Agriculture Movement
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UWAMWIMA	Umoja wa Wakulima wa Bogamboga Namatunda Zanzibar

Abstract

Title: Improving Small-Scale Farmer Households' Livelihoods Through Participation in a Development Project and Conversion to Organic Agriculture

Author: Laurine Schønning Kjærulff

This paper is based on a case study in Zanzibar, Tanzania where the socioeconomic impacts of a Danish/Tanzanian development project were inspected. The project aims at improving farmer households' incomes and yields through a conversion to organic agriculture (OA), and is based upon participation in learning groups. The data was collected on fieldtrips in Zanzibar through questionnaires of a sample of 44 households, supported by six semi-structured interviews. The data was the basis for calculating the changes in the households from 2015 to 2017 with focus on income, farming practice, yields and participation in the project. My main findings are that most of the households increased their incomes, organic yields, social activities and participation in training activities, which makes their livelihoods sustainable. The positive changes can either be caused by their participation in the project (and conversion to OA), influenced by non-project related factors or a mixture.

Keywords: organic agriculture; smallholders; sustainable livelihoods; participation; Zanzibar

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Introduction and research questions

Around 3 billion people live in rural areas in developing countries and most of these people are engaged in small-scale family farming. The rural areas are home to the world's poorest people, as 80% of the extreme poor¹ reside in rural areas (IFAD, 2018). Furthermore food insecurity in the world increases, which has significant negative impacts on rural people (FAO *et al*, 2017). Therefore, the rural communities in developing countries need special attention for reducing poverty and enhance both rural and agricultural development including improvements of livelihoods and food security (IFAD, 2016).

Some of the major challenges facing the rural communities are their vulnerability to climate change, increasing food demand, low yields, lack of non-farm income and stress on natural resources. However, as the majority of rural people are engaged in agriculture, they have opportunities to address some of these challenges through increasing and improving their agricultural production and thus producing a surplus for generating incomes through selling (*ibid.*). In that way, farming plays an important role for the sustainable development in rural communities as a livelihood strategy as well as for subsistence and poverty reduction.

A way to increase the agricultural productivity with minimal environmental and health-related harm is with organic agriculture (OA). OA can be defined as a farming system, that minimises the use of external inputs and has no use of chemical fertilizers and pesticides while being a holistic system that promotes and increases the health of agroecosystems (FAO, 2001). Later in this report, further definitions, of what OA implies, will be laid out. The United Republic of Tanzania (hereafter referred to as Tanzania) had in 2015 the biggest land area of certified OA in the African continent with 270,000 ha (0.7% of their total agricultural land), which is a +44% increase since 2014 and a higher increase than the average of +33.5% in the continent (FiBL & IFOAM, 2017). This makes Tanzania an interesting country to examine further.

Another important aspect of the development of poor rural communities is to include them in the development projects in order to empower them to utilize their social and economic potentials

¹ Extreme poor are living for less than 1.9 US dollars/day according to the 2015 International Poverty Line formed by World Bank (2015).

(IFAD, 2016). For a development project related to agriculture, the participation of the rural farmers can increase their agricultural productivity and improve their marketing of surplus (OD, 2015). Studies show that participation is a crucial factor for a development project to be successful (Pretty, 1995), and one way for the rural farmer households to participate in a development project related to agriculture is through farmer groups.

I have inspected the socioeconomic effects of a participatory development project focusing on organic farming for rural households. I did this through a 3-months fieldwork in Zanzibar, Tanzania from January to April 2018, where I examined a project between a Danish association, Organic Denmark (OD), and the Tanzanian partner organisations UWAMWIMA and Tanzania Organic Agriculture Movement (TOAM) as my case study. The project is built around 50 Farmer Family Learning Groups (FFLGs) on a village level with each group consisting of 15-30 small-scale farmer households. A goal for the groups is to enhance and improve their (non-certified) organic farm productions, and thus increase their yields and income from surplus marketing (OD, 2015). Through questionnaires I examined 44 households' changes in yield, marketing of their surplus, agricultural practice, income, occupation, social activity and participation from 2015 to 2017. The sample was selected from a baseline population of 310 farmer households' data from 2015. This research is furthermore supported by in-depth livelihood interviews with 6 farmer household representatives (FHRs) from the sample.

My research is based on below two research questions, which are addressed by sub-questions:

1. Which socioeconomic effects does a conversion to organic agriculture have on small-scale farmer households in developing countries?

The socioeconomic effects imply change in social life and income, which is related to the farmer households' occupations, agricultural production, food security, marketing of surplus and other livelihood changes in human, natural, social, physical and financial capitals.

1.1. In which ways have the FFLG project in Zanzibar affected the small-scale farmer households socioeconomically from 2015 to 2017?

1.2 What could be the reasons for the socioeconomic changes from 2015 to 2017?

2. How are these socioeconomic effects correlated to the farmer households' level of participation in the development project?

The level of participation is here defined by how often the farmer households participate in the project through their FFLG activities, training activities, the individual's valuation of FFLG participation level (low, middle or high), and whether or not they have presented ideas to their FFLG. Furthermore, the statements from the six interviews regarding participation and FFLGs are included.

2.1 Which levels of participation by the farmer households are seen in the project in Zanzibar in 2017, and how has it changed from 2015 to 2017?

2.2 What could be the reasons for their level of participation in 2017 and the changes in the participation levels from 2015 to 2017?

2.3 To which degree is the participation in the project correlated to the socioeconomic changes?

Through sub-question 1.1, the research will further address two indicators of the Zanzibar project²:

- *“By 2018 at least family members of 20 FFLGS have increased their income with 20% compared to project initialization”*
- *“By 2018 at least 20 FFLG have established joint marketing and are selling their bulked produce to the market” (OD, 2015)*

This report answers the above questions through six main chapters. The first chapter provides a background for my research, the second chapter is the theoretical framework for my report, and the third chapter is a statement of the methods I used. The fourth chapter is an introduction to my study area, Zanzibar, and the fifth chapter is a presentation and analysis of my results. The sixth and last chapter is a discussion of my results and analysis. The report is subsequently finalized with a conclusion.

² These indicators stems from the project's first objective: *“By the end of 2018 sustainable organic agriculture among 6000 small holder farmer family members organized in 50 Farmer Family Learning Groups in Zanzibar has increased family income with at least 30% from sale of vegetables and increased self-sufficiency”*.

1. Background for research

My case study, the FFLG project in Zanzibar, is inspirational for future participatory development projects approached through organic farming and farmer learning groups.

The on-going Civil Society in Development funded FFLG project commenced in the beginning of 2016 and will be completed by the end 2018. However, the formation of many of its now 50 FFLGs started before 2016 with farmer families³ as members learning about the organic farming methods and group governance through field experience, joint marketing, instructions and rotational visits to other groups (OD, 2015). Some of the goals with the FFLGs are for the groups to become completely independent and sustainable after the project is finalized, and that they result in increased agricultural production, empowerment and improved livelihoods (*ibid.*). The members are meeting on a regular basis organized by the group's facilitator, whose role is to guide the members according to needs, and should not act as a technical authority (*ibid.*).



From the left: Khamis, Skudhani and I. In front of UWAMWIMA's office in Stone Town. Photo: Bahati Khamis (2018)

OD was founded in 1981 and is focusing on all parts of the organic food chain with a mission that includes supporting the development of OA on an international level (OD, 2015). TOAM is one of the main stakeholders for the organic sector in Tanzania (UNEP & UNCTD, 2008), and has, since they were founded in 2005, been training smallholder farmers in OA in Tanzania. Together with OD, they developed the FFLG approach. UWAMWIMA is the association responsible for implementing the FFLG project in Zanzibar. It was founded in 2003 and has today around 2,300 members (OD, 2015).

My position in OD has been to examine the impacts of the project through a voluntary-based internship located in Zanzibar. I have myself been in charge of most of the preparation and execution of my fieldwork's data collection, including funding, with regular communication with OD. Undoubtedly, UWAMWIMA has been a major support and help during the whole process.

³ Most farmer households converted to OA while joining their FFLG, however some are non-organic (conventional or traditional) and some are using combined methods.

2. Theoretical framework

The theoretical framework for this report functions as a tool for addressing the results, analyses and discussions of my research. First, I set the development context followed by a presentation of different agricultural practices. Subsequently, I disclose the rural transformation in Sub-Saharan Africa and present the Sustainable Livelihoods Framework. Finally, I introduce the participation term in a development project context as well as a typology of participation.

2.1 Development context

As mentioned in this report's introduction, agricultural and rural development is crucial for reducing the enormous poverty and food insecurity affecting the rural communities in developing countries. Poverty and food insecurity are interconnected and can be a result of land pressure from increasing population densities as well as climate changes and shifting governance structures (Djurfeldt *et al*, 2005). Agricultural development is not only important for the poor rural households, but also for national economic growth. As the French agricultural economist John W. Mellor emphasizes, the faster the agricultural sector grows, the faster its relative share of the gross domestic product (GDP) declines (Mellor, 1966). In that way a shift to a greater focus on developing the agricultural sector prior to the industrial sector, will be beneficial for developing countries' socioeconomic development, as agriculture thus would function as a engine changing the production, consumption and labour market structures (Djurfeldt *et al*, 2005).

However, development in the agricultural sector is not sufficient for ensuring improvement of socioeconomic conditions for poor rural farmers, as a change in e.g. the country's political structures could also be crucial for ensuring the socioeconomic development of the citizens (*ibid.*). As the British development practitioner Robert Chambers (1986) stresses, rural people will benefit less from development than other sectors of the society⁴, which makes the benefits from development highly unequally distributed (Chambers, 1986).

In the 1960s many developing countries had a focus on industrialization and agricultural extension as drivers for rural development. This also included the many African countries gaining their independence from the colonial powers in that decade. However, there was a paradigm shift in the 1960s as small-scale agriculture changed to being considered the engine of development (Ellis & Biggs, 2001). Furthermore, a dominating development strategy in the 60s was to trickle and extend

⁴ As rural people are the ones in the society with fewest resources and smallest political influence (Chambers, 1986).

the modern technologies to the traditional communities⁵ (Degnbol-Martinussen & Engberg-Pedersen, 1999). In the 1960s the Green Revolution⁶ (GR) also began, and increased the food production for Asia and South America substantially, but not significantly for the African continent (Ellis, 2005).

In the 1970s a focus on the basic needs for the rural people approached, not least through food security (Ellis & Biggs, 2001). Food security is defined by FAO *et al.* (2017, p. 107) as “*a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.*” Food security is further divided into four dimensions: food availability, economical and physical access to food, food utilization and stability over time (FAO *et al.*, 2017). Food insecurity can thus occur – chronically, seasonally or temporarily – when the requirements for food security are not met for a given household or individual and could be caused by unavailability of food or lack of financial capital (*ibid.*).

Important themes in rural development in the 1980s included participation, empowerment and sustainable livelihoods (Ellis & Biggs, 2001). Together with the bottom-up ‘farmers first’ approach focusing on small-scale farms, these themes continues to be dominating the rural development today, where advocates such as NGOs play an increasing role in the development practices. Rural transformation has also become dominant in rural development, and is covering economic, social and institutional change with a focus on the inclusion of the rural people to ensure their economic and political rights (IFAD, 2016). With reference to sustainable agriculture, participation and empowerment and contrast to the homogenous knowledge-extension in the 1960s, professor Niels Röling (1985) suggests facilitation of learning through educated facilitators as an agricultural extension strategy instead of technology transfer. This type of agricultural extension is based on how communication can change agricultural behaviours with a collective effect through individuals and groups (Röling, 1985).

Today, sustainable development is a buzzword in development thinking, and is reflected in the United Nations’ (UN’s) 17 Sustainable Development Goals for 2030. Here, achievement of food

⁵ However, as the technologies were not matching the local conditions, it turned out to be a rather unsuccessful strategy (Baum & Tolbert, 1985).

⁶ The GR was an intensification of the agriculture through high chemical inputs and hybridized crops.

security is a central part of their second goal, *zero hunger*, which, according to the UN, can be approached by addressing the productivity and incomes of small-scale farmers (UN, 2018). The focus on sustainable development is linked to the global anxiety of environmental problems e.g. due to large-scale agriculture's chemical fertilizers and pesticides (Theocharopoulos *et al.*, 2012). However, the debate also goes that farming without chemical inputs (e.g. organic and traditional farming) cannot produce sufficient food to meet the high needs in poor developing countries (Seufert *et al.*, 2012).

Due to increasing pressure and scarcity on land (in Africa for instance), intensification rather than expansion of the agricultural land, is a sensible farming strategy that addresses food insecurity and poverty issues. Yet, not all agricultural practices are equally sustainable, as chemical inputs in conventional farming can damage the soil and environment, which will have a negative effect on the farm production.

2.2 Traditional, organic and conventional agriculture

As mentioned above, there is a common debate on whether traditional agriculture (TA) and especially organic agriculture (OA) can produce as much as conventional agriculture (CA), why I here elaborate what the three different agricultural practices imply.

TA usually has no or little technical and chemical input, and includes pastoralism, intercropping, shifting cultivation, permanent cropping and other labour-intensive farming systems. Most of the farmers in Tanzania, and the rest of Sub-Saharan Africa (SSA), are doing TA with primarily subsistence production (Aryeetey-Attoh, 2010). The use of indigenous technical knowledge (ITK⁷) has been practiced by farmers since time immemorial and is often implemented in TA, but also in OA and CA (Das & Mazumder, 2012). It is important to understand ITK for rural farming communities in developing countries; however, it is currently poorly integrated in the common agricultural science (*ibid.*).

OA is an "extended" version of TA, as it also includes other factors and dimensions than solely focusing on the farming system and production itself. OA was the fastest growing food sector during the last couple of decades (FAO, 2001) and has various ways of being defined.

⁷ ITK is local knowledge, special and unique in its cultural or geographical setting, and thus the opposite of modern scientific knowledge, which typically origin from universities and research institutions (Das & Mazumder, 2012).

The UNEP & UNCTAD (2008, p. 6) defines OA as a “...*system of agricultural production that seeks to promote and enhance an ecosystem’s health while minimizing adverse affects on natural resources*”⁸. It is a suitable farming system for poor rural farmers, as it is has low-costs and instead can be more labour intensive than CA (Scialabba & Hattam, 2002). UWAMWIMA is primarily defining OA through IFOAM’s principles of OA, which includes health (sustainability of health for humans, soils, plants and animals), ecology (sustainability of ecological systems and cycles), fairness (between the people involved in OA) and care (responsibility of well-being for current and future generations) (IFOAM, 2018). In 2015, 179 countries were doing certified OA, covering 1% of the world’s total agricultural land, which is an increase of +14.7% since 2014 (FiBL & IFOAM, 2017).

The importance of defining OA can be related to “organic” as a labelling and branding term to promote products being produced in accordance to the organic standards⁹ (FAO, 2001). However, in Zanzibar there is not yet a strong national market for the “organic” label and the organic and non-organic agricultural products are currently sold at similar prices. Instead, the reason for defining OA in the Zanzibar project is primarily to enhance the knowledge and methods of OA¹⁰ to the participating small-scale farmer households through the FFLGs as a mean to increase their production and yield in a sustainable way while improving and sustaining their livelihoods.

In CA genetically altered seeds can be used and is a way to achieve faster growing crops, higher yields and resistance to pests and deceases (United States Department of Agriculture, 2015). CA is an intensive farming system with high inputs of chemical fertilizers and pesticides, which are causing global environment concerns (Theocharopoulos *et al.*, 2012). In Tanzania, most farmers remain in small-scale farming doing TA with low inputs, however, during the last half century the Tanzanian government introduced CA aiming to improve the farmers’ livelihoods and incomes. Though this resulted in increased production, the prices on chemical fertilizers became too expensive for the small-scale farmers (TOAM, 2015).

⁸ UNEP & UNCTAD (2008) further emphasize that OA can be economically, environmentally, socially and culturally beneficial to developing countries.

⁹ In developing countries it can thus create export opportunities if the products are certified as organic.

¹⁰ The OA methods and knowledge imply producing their own organic fertilizers and manure from livestock, intercropping, mulching and crop rotation as well as creating access to water for irrigation and water management.

OA is more dependent on the farmer's knowledge and management practices than CA (Seufert *et al.*, 2012). Different studies¹¹ show that during the first years after conversion to OA, the yields are lower (e.g. Schrama *et al.*, 2018; de Ponti *et al.*, 2012), but gradually will increase due to the farmer's improved skills and the soil's fertility (Martini *et al.*, 2004). Added to the OA and CA discussion Seufert *et al.* (2012) have an important statement: "... to achieve sustainable food security we will probably need many different techniques – including organic, conventional and possible 'hybrid' systems." (Seufert *et al.*, 2012, p. 231).

2.3 Rural transformation in Sub-Saharan Africa

In Sub-Saharan Africa (SSA) the main livelihood involves small-scale agriculture¹² (up to 12 acres), either for subsistence and/or trading surpluses at the local or global markets (Ellis, 2005). However, the agriculture in SSA faces challenges such as climate changes, crops diseases, land pressure¹³ and insufficient funds to buy chemical fertilizers (*ibid.*).

The SSA agricultural sector is expanding with growth in productivity and outputs, while its relative shares of the countries' GDPs are decreasing. Currently the agricultural share in the GDP in SSA is 25%, while the governments spend less of the GDP on the agricultural sector (IFAD, 2016). Its effect on reducing poverty is not strong, and the count of hungry people in SSA has increased by +20% since 1990 (UNEP & UNCTAD, 2008). Furthermore, many countries in SSA remain, as the only countries in the developing world, "stuck" in the first phase of agricultural transformation, meaning that their surplus from agriculture is not managed and governed in a way that can generate economic growth (Timmer, 1988). Yet, this does not mean that the continent is getting poorer; during the last couple of decades the extreme rural poor decreased with -0.78% annually, the middleclass emerges and the incomes have been increasing with +1.28% annually (IFAD, 2016). Still, around half of the rural Africans live in extreme poverty.

Even though most economies in SSA are based upon agriculture, the food production is not sufficient to feed the whole population and thus food insecurity is a common challenge (Gordon &

¹¹ A study by Seufert *et al.* (2012) specifically indicates that the yields are improving after 3 years of doing OA and that the difference in yields for OA and CA can, for some crops, nearly be the same, but that they are highly contextual conditioned. A criticism to this study is that they compare OA with commercial high-input CA, which had higher yields than the averages in developing countries and thus making the comparison biased.

¹² Shifting cultivation is the most widespread farming system in Africa (Aryeetey-Attoh, 2010).

¹³ Land pressure can be a result of rapid population growth, hence increased rural population densities (Aryeetey-Attoh, 2010).

Gordon, 2007). The food insecurity can also be linked to a decline in the rural labour force engaged in agriculture, which further is connected the on-going rural transformation in SSA (*ibid.*).

The rural transformation in SSA refers to the changes and diversifications in livelihoods and occupations for the rural¹⁴ (IFAD, 2016). More and more people in SSA are engaged in non-farm economic activities¹⁵, which account for up to 45% of the total household incomes and have an increasing importance for the rural livelihoods¹⁶ (Barrett *et al.*, 2001). The rural non-farm economy can be seen as a pathway out of poverty, but is challenged by absence of infrastructure and unstable markets and employments (IFAD, 2016). Reasons for diversifying occupations include self-insurance in allocating economic activities across different occupations (Barrett *et al.*, 2001).

Evidence shows that SSA countries with the highest rates of rural transformation during the last couple of decades (e.g. Tanzania) were the ones that reduced their poverty the fastest¹⁷ (IFAD, 2016).

To sum up, improving the performance of the rural small-scale farmers remain important for reducing poverty and food insecurity, while diversification of rural livelihoods and increasing non-farm income in the same way can have a major impact on those issues (Ellis, 2005).

2.4 Sustainable Livelihoods Framework

As the previous section emphasizes, the livelihoods of rural farmers in SSA are complex and diversified. Therefore a multidimensional assessment and approach is necessary to be able to inspect and evaluate the impacts of rural development projects. To do this, a common framework is the Sustainable Livelihoods Framework (SLF), which I will use as a tool in the socioeconomic analysis in this report's fifth chapter. The SLF involves all of the topics presented in above theoretical sections.

¹⁴ Rural transformation is measured by “*the average annual percentage change in agricultural labour productivity as captured by agricultural value added per worker*” (IFAD, 2016, p. 147).

¹⁵ E.g. informal business and employment.

¹⁶ Studies suggest that non-farm occupations are six times more productive than farming due to increasing consumption and earnings (Barrett *et al.*, 2001).

¹⁷ Other countries with the highest rates of rural transformation and poverty reduction were Ethiopia and Cameroon while the lowest rates of rural transformation and low poverty reductions were measured in countries like Mauritania, Zambia and Lesotho (IFAD, 2016).

A livelihood can be defined as a combination of activities, assets and capabilities needed for means of living and will be defined as sustainable when it adapts and recovers from shocks and stresses while at the same time sustains or increases its assets and capabilities without damaging the environment (Chambers & Conway, 1991).

The below SLF is developed by the Department of International Development (DFID) and was introduced in the years around the millennium change. According to the DFID (1999) report, the approach is linked to participatory development due to the fact that the SLF “*will not be efficient unless operationalized in a participatory manner*”. This participatory development will be followed up upon in the next section. The SLF consists of five intertwined dimensions as illustrated below.

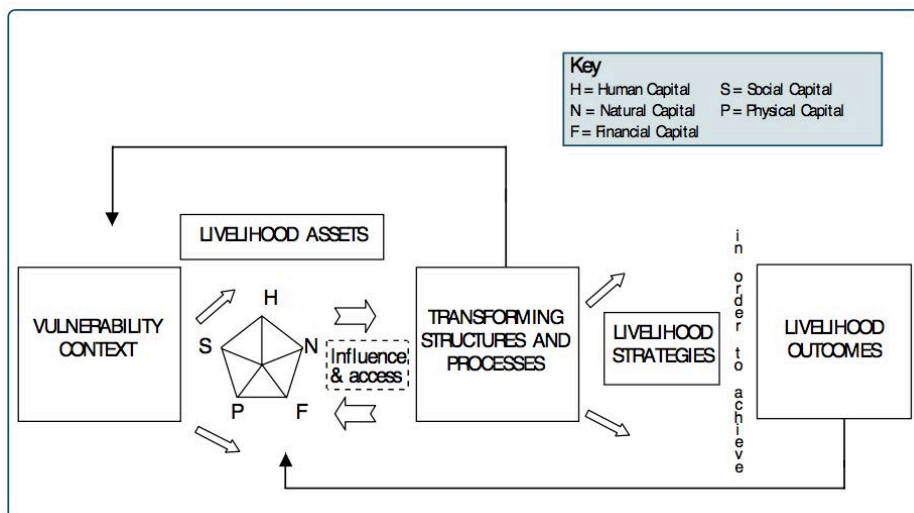


Figure 1. The Sustainable livelihoods framework (SLF). Source: DFID (1999).

The *Vulnerability Context*, refers to the external environment and its effects on people’s livelihoods through trends, shocks (e.g. to crops’ and livestock’s health) and seasonality (e.g. of price and production) (DFID, 1999). These factors can have direct impacts on people’s assets¹⁸.

The *Livelihood Assets* pentagon, is central for the SLF and consists of five capitals: human, social, natural, physical and financial, which all are interlinked and can influence each other. *Human Capital* is representing the person’s or household’s skills, knowledge, ability to work and health, while the *Social Capital* refers to the networks, relationships and memberships in groups, which for the Zanzibar project could be the FFLGs. *Natural Capital* is the natural resource base necessary for

¹⁸ Rural farmers’ assets could be their farming land and income from selling crops.

livelihoods e.g. nutrient cycles, and the *Physical Capital* consists of the basic infrastructure and producer goods e.g. affordable transport, shelter and water supply. The last capital, *the Financial Capital*, is the financial resources needed to obtain livelihood objectives and include both stocks (e.g. cash savings or livestock) and flows (e.g. income) (*ibid.*). The pentagon shape of the livelihood assets is a strong analysis tool for a multidimensional analysis, as it makes it possible to illustrate the variations in people's or household's assets as seen in combination with the SLF's other dimensions.

Transforming Structures and Processes can influence the assets highly, due to e.g. governments' possibilities of providing infrastructure and education. This dimension includes all the policies, legislation, organisations and institutions that influence the livelihoods and create the access to the assets (*ibid.*).

The livelihood assets further have great impact on the *Livelihood Strategies*, as more assets would lead to more livelihood strategy options. A livelihood strategy is the combination of activities and choices (e.g. farming or investing in livestock) that people and households make in order to achieve their livelihood goals. The *Livelihood Outcomes* are the direct results of the livelihood strategies and also have direct links to the livelihood assets, as the ability to e.g. escape poverty is highly dependant on the person's or household's assets. Other outcomes could be to get a higher income, increased yield and improved food security (*ibid.*).

For the analysis and discussion in this report I will mainly be using the *Livelihood Assets*, *Livelihood Strategies* and *Livelihood Outcomes* based on the 44 households' data from 2015 to 2017 collected through questionnaires. The interviews with six of those households will be used to address the same three dimensions and also include the *Vulnerability Context*. Thus, this report will not be including the *Transforming Structures and Processes* dimension of the SLF.

2.5 Participation in development projects

Development agencies have for a long time tried to involve the people by participation in parts of the planning and implementation of agricultural development projects (Pretty, 1995). Jules Pretty (1995) presents two schools of thought concerning participation: one that sees participation as a way to achieve more efficiency through support from the involved people and the other, which views participation as a fundamental right e.g. to ensure empowerment and collective action.

Studies show that participation in development projects can lead to improved efficiency, better understanding and learning capacity and more transparency and empowerment of the participating people, which can make participation the key to successful development projects (Paul, 1987; Isham *et al.*, 1995; Pretty, 1995). The Isham *et al.* (1995) study is based on projects from 49 developing countries across Africa, Asia and South America and showed that the highest success was achieved, when the people participated in all stages of the projects, and not when they were only involved in e.g. consultation.

Jules Pretty (1995) has set up seven types of participation, ranging from passive to more interactive and mobilizing participation, which have different levels of success potentials for supporting the goals of development projects and sustainable agriculture. The seven types of participation are presented in figure 2, and will be used as a tool for analysing the types of participation implemented in the FFLGs in the Zanzibar project. It should here be noted, as Pretty (1995, p. 1,253) states, “*the problem with participation as used in types one to four is that any achievements are likely to have no positive lasting effect on people’s lives*”.

There have been different approaches to participation, where two of the most common used are the Participatory Rural Appraisal (e.g. Henman & Chambers, 2001) and Participatory Learning and Action (e.g. Kenton, 2014).

An approach, which is specifically aiming participation in agriculture, is the Rural Initiatives for Participatory Agricultural Transformation (RIPAT), that seeks to “*close the agricultural technology gap as a means of improving livelihoods and self-support among rural small-scale farmers*” (Vesterager *et al.*, 2017, p. 5). Their manual consists of clear guidelines including formation of RIPAT farmer groups¹⁹ with facilitators and sharing of agricultural technological knowledge through participatory learning. RIPAT therefore has similar characteristics to the FFLG project in Zanzibar.

¹⁹ These groups consist of 25-30 farmers each.

Typology	Characteristics of each type
1. Manipulative participation	Participation is simply a pretence, with “people’s” representatives on official boards but who are unelected and have no power.
2. Passive participation	People participate by being told what has been decided or has already happened. It involves unilateral announcements by an administration or project management without any listening to people’s responses. The information being shared belongs only to external professionals.
3. Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information gathering processes, and so control analysis. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people’s views.
4. Participation for material incentives	People participate by contributing resources, for example, labor, in return for food, cash or other material incentives. Farmers may provide the fields and labor, but are involved in neither experimentation nor the process of learning. It is very common to see this called participation, yet people have no stake in prolonging technologies or practices when the incentives end.
5. Functional participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project. Such involvement may be interactive and involve shared decision making, but tends to arise only after major decisions have already been made by external agents. At worst, local people may still only be coopted to serve external goals.
6. Interactive participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.
7. Self-mobilization	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilization can spread if governments and NGOs provide an enabling framework of support. Such self-initiated mobilization may or may not challenge existing distributions of wealth and power.

Source: adapted from Pretty (1994), Satterthwaite (1995), Adnan, Alam and Brustnow (1992), and Hart (1992).

Figure 2. Jules Pretty’s typology of participation: how people participate in development programs and projects. Presented in Pretty (1995).

3. Methods

In order to use the above secondary data based theoretical framework in my research, I used selected primary data collection methods, namely questionnaires and semi-structured interviews through fieldwork. To be able to compare the households' data from 2015 to 2017, those methods were necessary and will here be elaborated.

3.1 Questionnaires

The questionnaire is an obvious method for collecting a large number of different household's data that can be used for statistical work and comparisons, as is the case for my research. I was provided with 310 households' data from the baseline population's questionnaire data collected in 2016, representing 39 different FFLGs. I selected a sample seeking to represent that population, as I did not have enough resources to visit all of the 310 households since filling out questionnaires required personal visits to each farmer household representative (FHR). The sample selection began using a random selection method by choosing every 10th household out of the list of 310 households, supported by 1-2 extra households²⁰ from each FFLG, to secure attendance from at least one FHR when visiting their village. My final list consisted of 103 FHRs, however only 44 of these ended up doing the questionnaire due to both no-shows and my own time schedule. The 44 FHRs are, as well as the whole baseline population, small-scale farmer households with an agricultural production both for subsistence use and for most of them also enough surplus to sell. Further characteristics of the 44 respondents follow in chapter 5.

UWAMWIMA arranged the meetings with all of the households, which on Unguja took place



Questionnaire with FHR. Photo: Said Abdalla Khator (2018)

between 15-02-2018 and 01-03-2018 and on Pemba between 12-03-2018 and 14-03-2018. For the questionnaire field trips I was accompanied with UWAMWIMA employees, Skudhani and Mcha on Unguja and Hassan on Pemba, as well as my translator and driver, Said. My translator was crucial for the success of the data collection through questionnaires, as most of the farmers couldn't speak English,

²⁰ Which was selected on the basis of ensuring variation in sexes, ages and farming practices.

and Said therefore translated what they said in their language, Kiswahili, to English. All of the 44 questionnaire field trip visits went successfully and as expected.



Questionnaire fieldtrip, where I was accompanied with Said, Skudhani and Mcha. Photo: Laurine Schønning Kjærulff (2018)

The final questionnaire template was a copy of the one used for the baseline as well as one extra page of questions that I formulated on my own to cover the socioeconomic and participation themes more broadly. The template is enclosed in appendix A. As the 44 FHRs had answered identical questions regarding their household's information, income, occupations, farming practice, crops, yields, participation and marketing for 2015 (baseline made in 2016) and 2017 (my research made in 2018), I was able to make calculation of the changes that had occurred during those two years. I made these calculations using Microsoft Excel's analytical tools including simple calculations such as percentage (shares and change) and average values.

3.2 Sample's representativity of population

By conducting a chi-squared test, I can conclude that my sample of the 44 households (representing 26 FFLGs) used in my research is representative of the population of the 310 households in the baseline from where the sample origins. The sample thus has a share of 14% of the baseline population²¹. This conclusion has been made as the distribution of 14 parameters (e.g. income, sex, age, location, occupation and farming practice) in the sample, as it follows the distribution in the population, which is based on a calculated p -value for each of the parameters. All of the parameters and calculations are enclosed in appendix D.

The p -values determine, whether I can accept or reject the null hypothesis, which for all the given parameters state that the distribution in the sample follows the distribution in the population. I have

²¹ It should further be emphasized that the whole FFLG project contains around 1,000 households and 50 FFLG, thus the baseline does in fact also seek to represent all the households with its 39 FFLGs (78%) and 310 households (31%).

accepted all of the null hypotheses on a 5% significance level, as they all had a p -value of above 5% (0.05)²².

By concluding that my sample is representative of the population, I thus allow myself to say that all of my results and analysis of the socioeconomic changes from 2015 to 2017, as well as the participation in project, for the sample are indicating the 2015-2017 changes for the whole population.

3.3 Interviews

The interviewees are a selection of six out of the 44 FHRs after the ended questionnaire collection. The purpose of the interviews was to get more insight in the households' livelihoods and their human, social, natural, physical and financial capitals. I selected the six interviewees based on my wishes to cover different types of households with different changes from 2015 to 2017 in e.g. income and yield, as a way to make them more representative. After the ended questionnaire collections I inserted all data on the households into an Excel sheet and made a rough comparison from 2015 to 2017 for each household. Based on those comparisons, I chose households with respectively increased and decreased incomes and high and low participation levels. Four of the households were on Unguja and the other two on Pemba, and the questionnaires were answered by four female and two male FHRs. Three of the households represent the low-income group (LIG) and the other three the high-income group (HIG). All of the three interviewed households in the LIG increased their income significantly from 2015 to 2017, which resulted in two shifts to the middle-income group (MIG) and one to the HIG. Of the three interviewed households originally belonging in the HIG, none of them remained in that income group in 2017; two shifted to the MIG and one to the LIG.

I decided to make a semi-structured interview in order to secure that specific topics were covered, while still being open to new and interesting questions that could arise during the interview. I formulated 75 main questions (with some having follow-up questions) divided into six themes: *Organic farming and FFLG, Human capital, Natural capital, Financial capital, Physical capital and Social capital*. The last four questions were personalized to the individual interviewee e.g. with

²² The best (highest) p -values are seen in the distribution of districts (0.968), household sizes (0.967) and organic crops cultivated (0.915) and the worst (lowest) p -values are seen in the distribution of sex of the head of household (0.057) and farming practices (0.132).

questions about the reasons for their income change and participation level. The interview guide is enclosed in appendix B.

The interviews took place on Pemba on 15-03-2018 and 17-03-2018 and on Unguja on 02-04-2018 and 04-04-2018. On these fieldtrips, I was again accompanied with UWAMWIMA employees and my translator and driver, Said, who also translated all the interview-questions to Kiswahili, prior to conducting the interviews. The interviews were all very successful, as the interviewees were happy to participate, even though every interview lasted between 1-2 hours. The interviews were recorded on an iPhone, and I also wrote down all their answers on paper, which was later formed into shorter summaries enclosed in appendix C.

The statements in the interviews were used to support the analysis and discussion of the results from the questionnaires collections and furthermore to be able to make a Sustainable Livelihood Framework and an analysis on the participation types in the FFLGs.



Interviewee Sharifa Said (appendix C4) with grandson. Photo: Laurine Schønning Kjærulff (2018)

3.4 Challenges to my first research question

I have chosen to keep my first research question²³ in its original form, even though it in practice has been challenging to collect data sufficient to address it. This is mainly due to the fact that I did not have access to data representing the households' agricultural production before the conversion to OA as well as the fact that many of the households did not continue to cultivate the same crops in 2017, as they did in 2015, thus making it more difficult to calculate the changes. However, a number of households did continue to cultivate some or all of their crops into 2017, and the changes in yields are therefore solely based on those observations.

Further, I am able to analyse the socioeconomic changes for the households from 2015 to 2017, which is crucial for that research question, and those changes can be compared with the changes in yields. The fact, that they converted to organic farming either in the years up to the 2015 baseline or during the two years until the 2017 questionnaire, makes it further sufficient for my research to connect those changes to the organic conversion, though to a varying degree depending on the data's reliability. Of these reasons, together with the fact that the organic conversion is a central part of the Zanzibar project, I chose not to edit my first research question.

²³ 1. Which socioeconomic effects does a conversion to organic agriculture have on small-scale farmers households in developing countries?

4. Study area: Zanzibar, Tanzania

It is crucial to know the context of the country, you are doing fieldwork and research in. Nevertheless for my research as I'm evaluating the socioeconomic effects of an on-going project, and in this connection also discuss whether some of the reasons behind the changes from 2015 to 2017 lies in the context, other non-project related factors, the project itself or a mixture. Therefore, a brief overview of the context in which I was working in, Zanzibar, is here presented.

Tanzania is a resource-scarce coastal country located in East Africa just south of the Equator (see map in figure 3), which was officially formed in 1964 as a unity between former mainland Tanganyika and Zanzibar one year after their independences from the British colonial power (Collier, 2007; Suksi, 2011). The semi-autonomous Zanzibar archipelago is located in the Indian Ocean 45 km off the mainland Tanzania's east coast and consists of two main islands, Unguja and



Unguja landscape. Photo: Laurine Schønning Kjærulff (2018)

Pemba (Suksi, 2011). The economy of Tanzania is based upon agriculture, which has a 25% share of the country's GDP and around 80% of the earnings from export and employment (TOAM, 2015). Tanzania has, on its almost 1 million km², a current population of 55.5 million people, of which 1.3 million reside on Zanzibar's 2,461 km², with the vast majority on Unguja (The World Bank, 2018; OD, 2015). The Zanzibaris are primarily of Bantu and Arab origin, and the official languages, of both Zanzibar and mainland Tanzania, are Kiswahili, English and Arabic. The Arabic history of Zanzibar has also set its mark in the islands' religion, as 95% of the Zanzibaris are Muslims.

In the tropical coastal environment of Zanzibar the mean daily maximum temperatures ranges between 29 and 31 °C during the whole year. Zanzibar has a main rainy season from March to May and a smaller rainy season during November to December (Meteoblue, 2018). However, due to global warming the precipitation in Zanzibar has become more intense during recent years, and the temperatures have been rising (Watkiss *et al.*, 2012). The landscape on Unguja is mostly flat with coral rag, bushy vegetation and a smaller share of forest as well as the infamous, and increasingly touristic, coral white beaches (Mikidadi, 2011).

Pemba, on the other hand is a hilly island with more fertile soils than in Unguja, and both islands are known for their unique coral reefs surrounding the islands (*ibid.*).

Around 70% of the Zanzibaris live in rural or semi-urban areas with the majority of these people relying on agriculture for subsistence use. Around 44% of the population in Zanzibar were extreme poor in 2015, with Pemba having a higher poor share of their population than Unguja (The World Bank, 2017). Furthermore, around one third of the population suffers from malnutrition (OD, 2015). Despite Tanzania's average annual GDP per capita growth of +3.5% from 2010-2015 (The World Bank, 2018), rural poverty increased on Pemba with 8 percentage points, but declined on Unguja with 3 percentage points from 2010-2015 (The World Bank, 2017). Assessing the rural poverty challenges on Zanzibar can thus naturally be by targeting the poor rural smallholder farmer households through agricultural and rural development.



Pemba landscape. Photo: Laurine Schønning Kjærulff (2018)



Children in a small rural village on Pemba. Photo: Said Abdalla Khator (2018)

While many Zanzibaris' livelihoods involve fishing and seaweed aquaculture, around half of the population – pre-dominantly women – are employed in agriculture (RGoZ, 2009). The potential for development of the agriculture is high due to the islands' good soils and tropical climate. However, challenges remain for the smallholder farmers such as poor infrastructure, climate changes and

expensive farm inputs (TOAM, 2015; RGoZ, 2009). As OA provides sustainable farming methods reducing input cost, using local available resources and resulting in healthy crops more resilient to climate changes, it is an evident farming strategy to implement for the poor smallholder households

in Zanzibar. OA can further address the food insecurity issues in Zanzibar, as increased yields and agricultural low-cost production are necessary to meet the food needs of the rapid increasing population growing with 1.3% per annum (The World Bank, 2018). The need for Zanzibar to be more self-sustaining in their food production is further an important matter, as they currently import around 40% of their stable food needs²⁴ (OD, 2015).

The Revolutionary Government of Zanzibar (RGoZ) did indeed incorporate and focus on agriculture, and specifically recommending OA, in their 2010-2015 ‘Strategy for Growth and Reduction of Poverty’ (RGoZ, 2010) as well as in their 2010-2020 vision of ‘Agricultural Transformation for Sustainable Development’ (RGoZ, 2009). Since the president of Zanzibar, Ali Mohamed Shein, was elected in 2010, the RGoZ increased their investments in the agricultural sector, which currently accounts for 10% of public spending (OD, 2015).



A female seaweed farmer in Jambiani, Unguja (left) & a farm in Unguja (right). Photos: Laurine Schønning Kjærulff (2018)

²⁴ Including rice and vegetables.

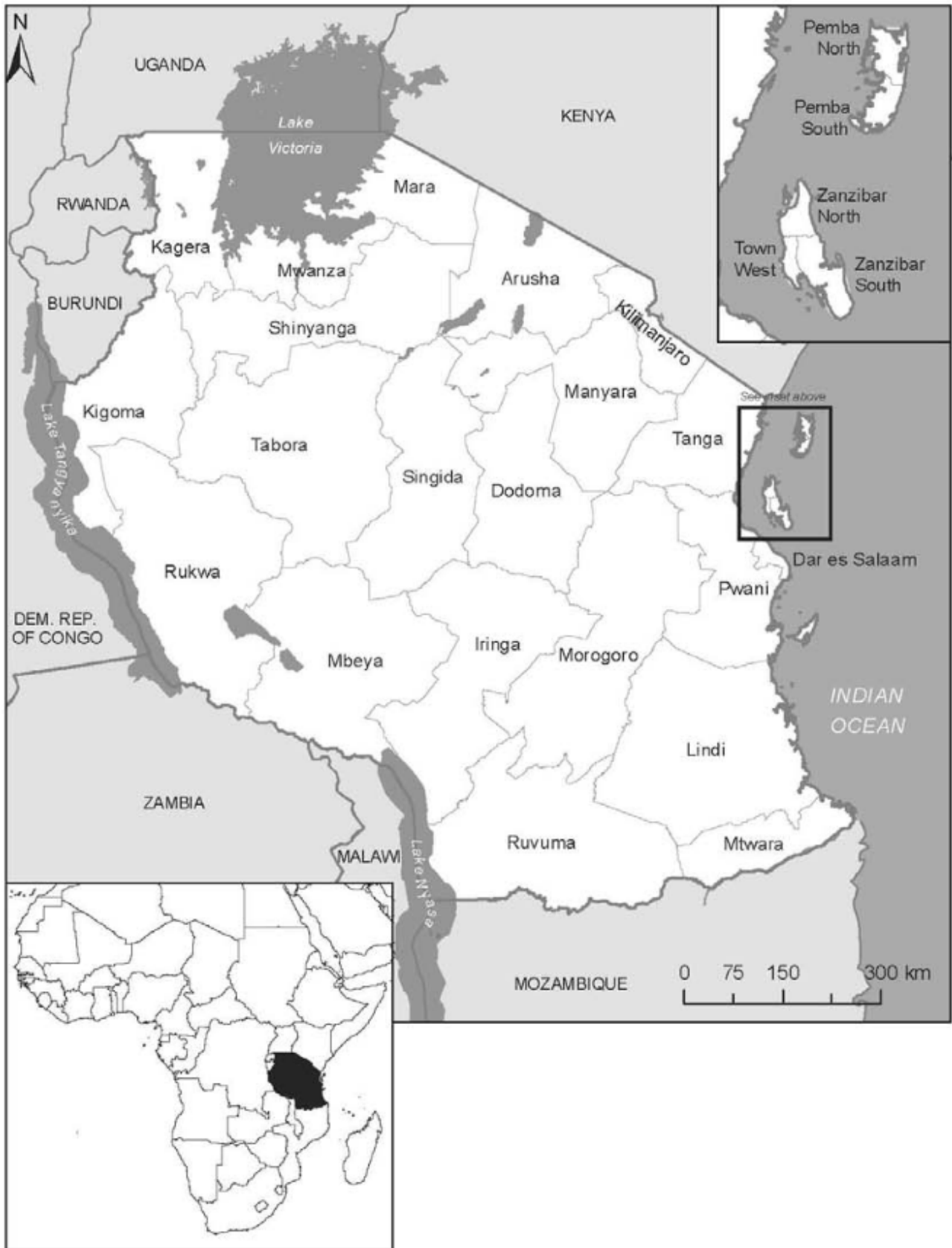


Figure 3. Map of mainland Tanzania, its location in the African continent and the Zanzibar archipelago. Source: National Bureau of Statistics Tanzania & ORC Macro (2005).

5. Results and analysis

In this chapter I introduce my case area followed by a short overview of the households in my sample. In the subsequent sections the households are presented as divided into three groups based on their incomes in 2015 with related socioeconomic characteristics; this analysis is primarily based on the results of the questionnaires. The sample is then analysed in section 5.4 based on the socioeconomic changes from 2015 to 2017, where the outcome from the interviews are also included together with factors, which was solely a part of the questionnaires carried out by me and were thus not included in the baseline. The socioeconomic changes are additionally addressed through a Sustainable Livelihoods Framework in the same section. Finally, the participation in the Zanzibar project is presented and analysed, which also is based on data from both the questionnaires and interviews.

5.1 Case study area

It was important for me that my sample was as representative to the baseline population as possible. I therefore conducted the questionnaires and interviews in all of the districts in Unguja and Pemba represented in the baseline.

Below are maps showing the locations of where the questionnaires and interviews were conducted with the respondents both on Unguja and on Pemba. Some of the respondents are located in the same spot, as they live in the same village. On table 1 is an overview of the locations and dates for each questionnaire and interview meeting.

As specified in table 1, two interviews were held in Zanzibar's capital, Zanzibar City (Stone Town area), more specifically at UWAMWIMA's office.

Respondent no.	District	Island	Date visited
1-7	Kaskazini A and Kaskazini B	Unguja	15-02-2018 02-04-2018 interview with no. 2
8-13	Kaskazini A	Unguja	20-02-2018
14-18	Mjini Magharibi, Magharibi A, Magharibi B and Kati	Unguja	22-02-2018 02-04-2018 interview with no. 16
19-23	Kusini and Kati	Unguja	27-02-2018 04-04-2018 interview with no. 20 in Zanzibar City (Stone Town)
24-27	Kati	Unguja	01-03-2018 04-04-2018 interview with no. 26 in Zanzibar City (Stone Town)
28-32	Mkoani	Pemba	12-03-2018 17-03-2018 interview with no. 32
33-38	Mkoani, Micheweni and Wete	Pemba	13-03-2018 15-03-2018 interview with no. 35
39-44	Mkoani, Chake and Wete	Pemba	14-03-2018

Table 1. Overview of respondent number, district, island and date for visit incl. the dates for interviews.

5.2 Overview of households

Of the 44 FHRs 60% are women and 40% are men. 61% of the households live on the island of Unguja, while the other 39% live on Pemba. Different age groups are presented in my sample; in 2017 23% were 18-35 years old, 55% from 36-53, 20% from 54-71 and 2% were 72 years old and above. In 2015 57% of the 44 farmer households were using entirely organic farming practices – with the remaining either doing a mix of organic and non-organic (conventional and traditional farming) or only non-organic – while the share of entirely organic farmer households grew to 84% in 2017. The sample represents 26 FFLGs.

5.3 Household groups 2015

I decided to categorize the 44 households by dividing them into three groups based on their income in 2015, which is in Tanzania Shillings (TZS)²⁵. The reasons for defining the groups based on income are that I believe their incomes can be correlated to their yields, participation and marketing methods, and I thus assume there will be (more or less clear) tendencies and characteristics for each group. Below is presented a scatter diagram showing the 44 households' total income in 2015 and the division of the three income groups.

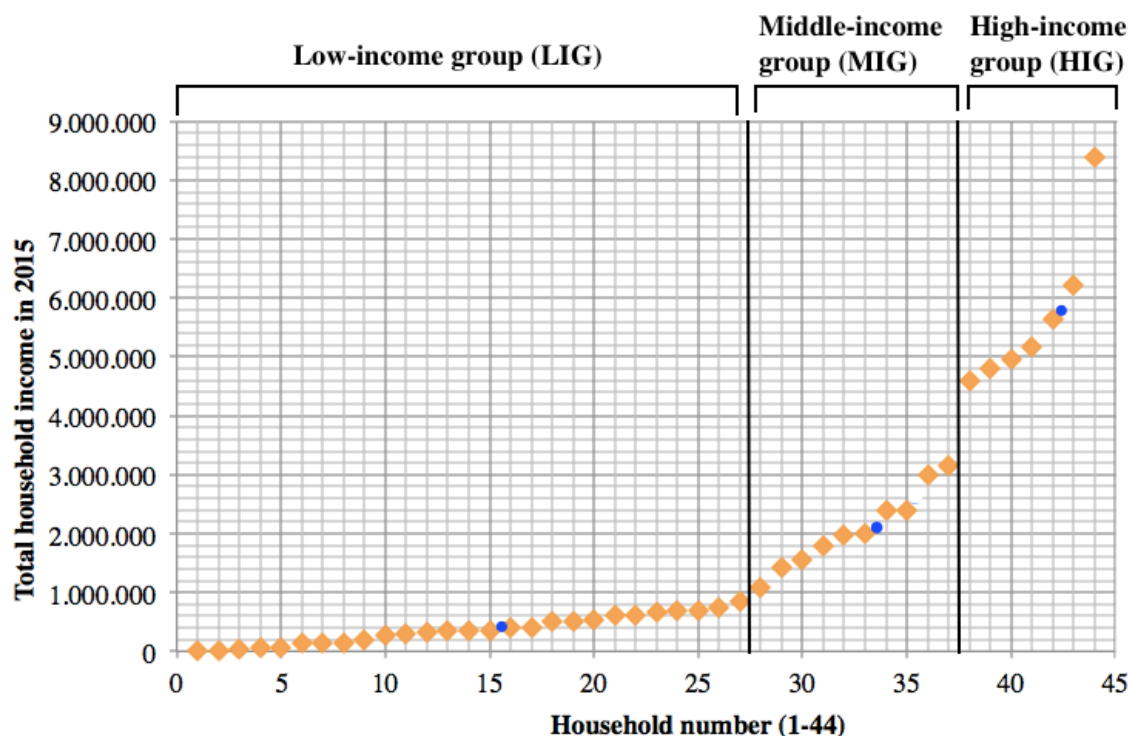


Figure 6. Scatter diagram showing the total income (TZS) in 2015 for the 44 households and the division of the three income groups. The blue dot indicates the average value.

As can be seen above, most of the households in 2015 (61%) had an income of below 1,000,000 TZS. There is a smaller group of households (23%) with an income over 1,000,000 but less than 3,500,000 TZS and even fewer households (16%) with an income above 3,500,000 TZS. This results in dividing the households into three groups based on the different gradients as seen on figure 6, low-income group (LIG), middle-income group (MIG) and high-income group (HIG)²⁶.

²⁵ 100.000 Tanzania Shillings (TZS) = 276 Danish krone (DKK).

²⁶ The same intervals for income groups were used as part of the chi-squared test (see appendix D).

Group 2015	Total household income 2015	Number of households in the group
Low-income group (LIG)	0-999,999 TZS	27
Middle-income group (MIG)	1,000,000-3,499,999 TZS	10
High-income group (HIG)	3,500,000 TZS and above	7

Table 2. The three household groups.

The number of households in the groups can have an impact on the characteristics presented in below sections, as well as the changes from 2015 to 2017. The more households in the group, the more reliable will the data be. This will definitely be considered a bias, however the data from the groups with fewer households (MIG and HIG) will still be treated as important and reliable as the LIG representing the most households.

5.3.1 Socioeconomic characteristics of the household groups in 2015

Household characteristics 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Male head of household	9%	70%	71%	59%
Female head of household	81%	30%	29%	41%
Male respondents	9%	80%	71%	40%
Female respondents	81%	20%	29%	60%
Unguja	63%	60%	57%	61%
Pemba	37%	40%	43%	39%
Average number of people per household (and minimum/maximum range)	6.4 (3-12)	5.6 (2-9)	6.6 (3-10)	6.2 (2-12)
Average age of respondent (and minimum/maximum range)	43 (19-69)	39 (28-66)	38.9 (30-59)	41.4 (19-69)

Table 3. Characteristics of the households and respondents in 2015.

As appears on above table there is a clear majority of female head of households and respondents for the LIG and a contrasting dominance of male head of households and respondents for the MIG and HIG²⁷. The project has a focus on empowering women through actively participating female

²⁷ The reason for the 10 per cent points difference in the share of male head of households and male respondents, is that one of the male respondents was not the head of household, but instead his wife was.

memberships in the FFLG, and this could be a reason why many female-headed households are represented in the LIG and in the sample in general.



Women sitting with their children, Pemba. Photo: Laurine Schønning Kjærulff (2018)

The total sample size has 59% male-headed households and 41% female. This division, however, is not very representative of the whole Zanzibar archipelago, where statistics show 77% male and 23% female-headed households (Ministry of Health, Community Development, Gender, Elderly and Children Tanzania *et al.*,

2016). Again, this indicates that the project is

specifically targeting female-headed households or that many of those types of households that were interested in joining the project.

Typically, a female-headed Tanzanian household does not have a father/husband, as the majority of female household heads are single, divorced or widowed (Anderson *et al.*, 2016). This could be interpreted as the males being capable of earning more money than females and/or being more productive, as most male-headed households are in the MIG and HIG. There is not as big difference within the groups, when it comes to average household size and age of respondent, however the HIG has the biggest average household size of 6.6 people and on average youngest respondents of 38.9 years.

Occupation/ income 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Occupations (percentage of total group and number of observations)				
Crop farming	100% (27)	100% (10)	100% (7)	100% (44)
Livestock	14% (4)	60% (6)	14% (1)	25% (11)
Employment	22% (6)	20% (2)	14% (1)	20% (9)
Business	15% (4)	20% (2)	29% (2)	18% (8)
Other	15% (4)	10% (1)	14% (1)	14% (6)
Average income for each occupation type in TZS, share of total income in % and minimum/maximum range in TZS (only for the ones with an income)				
Crop farming	236,704 (65%) (30,000-740,000)	1,177,000 (57%) (300,000-2,400,000)	4,241,429 (75%) (3,600,000-6,130,000)	1,086,841 (68%) (30,000-6,130,000)
Livestock	6,481 (2%) (30,000-100,000)	341,000 (16%) (60,000-990,000)	192,857 (3%) (1,350,000-1,350,000)	112,159 (7%) (30,000-1,350,000)
Employment	57,741 (16%) (50,000-48,000)	408,000 (20%) (1,680,000-2,400,000)	805,714 (14%) (5,640,000-5,640,000)	256,341 (16%) (50,000-5,640,000)
Business	28,519 (8%) (30,000-250,000)	90,000 (4%) (300,000-600,000)	428,571 (8%) (600,000-2,400,000)	106,136 (7%) (30,000-2,400,000)
Other	35,556 (9%) (150,000-360,000)	63,500 (3%) (635,000-635,000)	13,714 (0%) (96,000-96,000)	38,432 (2%) (96,000-635,000)
Total	365,000 (40,000-840,000)	2,079,500 (1,080,000-3,150,000)	5,682,286 (4,600,000-8,400,000)	1,600,591 (40,000-8,400,000)

Table 4. Occupations and incomes in 2015.

The table above emphasizes that all of the 44 households in the groups are occupied in crop farming, however five households do not have income from their farming. Many of the households are occupied in more than crop farming. Some of the main differences between the three groups are that the MIG has a significant higher share of households with livestock, and the share of households doing business increases from the LIG to HIG, while the opposite tendency is seen for employment.

By looking at the shares of total income it is clear that the crop income has the biggest share in all of the three groups, with the biggest in the HIG. This could indicate that the high incomes in the HIG have a direct relation to their crop farming.



From top: woman in the field, livestock and woman braiding a rug as a non-farm occupation. Photos: Laurine Schønning Kjærulff (2018)

The average household income for the whole sample was 1,600,591 TZS in 2015, which equals an average of 1.9 US dollars²⁸ (USD) a day per household. Some of the 44 households are therefore considered extreme poor, while others are above the line, yet still poor. The distribution of the households below and above this extreme poverty line is presented below.

Extreme poverty in 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
<1,9 USD/day	100%	30%	0%	68%
>1,9 USD/day	0%	70%	100%	32%

Table 5. Distribution of extreme poverty in 2015 according to the 2015 International Poverty Line (The World Bank, 2015).

The distribution shows that most (68%) of the 44 households are extreme poor, which, according to a study by Anderson *et al.* (2016), corresponds to the general Tanzanian share of extreme poor among small-scale farmer households. There is a logical division between the three income groups from most extreme poor in the LIG and least in the HIG; the LIG has incomes from 0 to 1 USD/day, the MIG 1.3 to 3.8 USD/day and the HIG 5.5 to 10.1 USD/day.

Farm size and practices 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Average farm size and minimum/maximum range (acres)	2.3 (0.01-6.5)	3.1 (0.25-4.75)	1.6 (0.5-3.85)	2.2 (0.01-6.5)
Organic farming practise	58%	60%	57%	58%
Non-organic farming practice	4%	10%	14%	7%
Both organic and non-organic farming practises	38%	30%	27%	35%

Table 6. Farm size and farming practices in 2015.

To my surprise, the HIG, which is the group with the highest income from crop farming, has the smallest average farm size as seen on table 6 above. However, this could be explained by cultivating many different crops in the same piece of farmland.

²⁸ 1 TZS = 0,000438 USD.

As there were too few observations for non-organic cultivated crops' yields to make valid calculations, those have been left out, and instead I focus on the organic yields, even those too can be questionable due to few observations. When it comes to which crops the 44 households cultivated organically in 2015, cassava was the most popular, as 57% of the households cultivated it. 45% of the households cultivated banana, and 39% cultivated tomato, while the least cultivated crops included watermelon and onion with 5% and cucumber with 9%.



Cassava plant (left) & banana palm (right) on Unguja. Photos: Laurine Schønning Kjærulff (2018)

Organic crops 2015	LIG	MIG	HIG	Whole sample
Green vegetable ²⁹	44 (n=9)	32 (n=5)	433 (n=3)	36 (n=17)
Tomato	48 (n=10)	2,100 (n=2)	960 (n=1)	89 (n=13)
Okra	13 (n=4)	58 (n=4)	N/A	16 (n=8)
Eggplant	18 (n=9)	1,200 (n=1)	2,160 (n=1)	46 (n=11)
African eggplant	287 (n=3)	800 (n=1)	N/A	273 (n=4)
Cassava	19 (n=18)	414 (n=4)	119 (n=3)	20 (n=25)
Banana	212 (n=13)	1,243 (n=4)	889 (n=3)	154 (n=20)
Rice	30 (n=8)	400 (n=1)	100 (n=1)	27 (n=10)
Cucumber	1,600 (n=1)	2,525 (n=2)	16 (n=1)	666 (n=4)
Green pepper	93 (n=2)	800 (n=1)	887 (n=3)	290 (n=6)
Watermelon	N/A	275 (n=2)	N/A	275 (n=2)
Yams	150 (n=4)	250 (n=2)	N/A	100 (n=6)
Maize	111 (n=3)	425 (n=2)	N/A	135 (n=5)
Onion	160 (n=1)	N/A	400 (n=1)	140 (n=2)

Table 7. Average organic yields (kg/acre) per household (only the ones cultivating the respective crops) in 2015. The colours range the average yield in the three income groups, where red = lowest, yellow = middle and green = highest. N/A = no observations and white = no yields to compare with.

²⁹ Green vegetables are here defined as leafy green vegetables such as spinach and salad.

As some of the average yields are based on extremely few observations, especially in the MIG and HIG, it is not completely legitimate to compare all of the yields. Around half of the households in each group cultivated cassava and banana, which makes them the crops with the most observations in all the groups, and thus with most reliable yields. Here, it seems that the MIG has the highest yields followed by the HIG and the LIG has the lowest yields. A reason for the major yield variations could be different use of and financial access to fertilizer, pests and diseases, knowledge about e.g. intercropping, crop rotation and organic manure and compost as well as access to water for the farm.

Marketing 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Marketing method				
Local open market	30%	40%	43%	35%
Middleman	35%	40%	43%	37%
AMCOS	0%	10%	0%	2%
Other	35%	10%	14%	26%
Agricultural production sold				
Average share sold of total production	54%	67%	89%	63%
Did sell	96%	100%	100%	98%
Did not sell	4%	0%	0%	2%
Joint marketing				
Yes	7%	10%	42%	14%
No	93%	90%	58%	86%

Table 8. Agricultural marketing in 2015 for the three groups.



A farmer prepares her harvested green vegetables.
Photo: Laurine Schønning Kjærulff (2018)

Regarding the marketing of their agricultural (surplus) production in 2015, there is an overall equal division between selling at the local open market and through a middleman. 100% of the households in the MIG and HIG sold their agricultural products in 2015. The HIG is the group that sold most of their total agricultural production (89%), which decreases gradually for the lower

income groups. Only one household sold their agricultural products through AMCOS³⁰ and there were also a few using other marketing methods, with a majority being in the LIG.

Participated in training activities 2015	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Yes	30%	90%	43%	45%
No	70%	10%	57%	55%

Table 9. Participated in training activities in 2015.

Above table shows that the MIG has the highest participation in training activities, followed by HIG and the lowest participation is in the LIG. Training activities imply training in organic farming practices and advocacy capacity, which is provided by organisations such as UWAMWIMA, Tanzanian Ministry of Agriculture, TOAM and OD. The participation could be connected to the household's success, as the households with higher income tend to have a higher level of participating in the training activities.

To sum up, the LIG is characterized by extreme poor female-headed households, with relatively low shares of incomes from occupations other than crop farming and an average farm size of 2.3 acres. The group has the smallest share of total crop production being sold, which could be an indicator for more subsistence farming, as the non-farm incomes might not be sufficient to ensure food security to the households. Also, the group has the lowest average yields compared to the other groups. The LIG is not doing much activity with other members as they have the lowest share of joint marketing and participation in training activities. The MIG is characterized by male-headed households, of which 30% are extreme poor, with large shares of livestock occupation beside crop farming, but higher incomes from employment and a high participation in training activities. The MIG has the highest average organic yields for most of the crops, as well as the highest average farm size of 3.1 acres. The HIG is characterized by male-headed households, with most of their income coming from crop farming, even they have the lowest average farm size of the groups on 1.6 acres. The HIG sold most of their total production, which could be due to a large surplus compared to their subsistence food needs, as their high incomes might cover a significant share of their food expenses. Around half of the households in the HIG participated in training activities and made joint marketing with the other members in their FFLG.

³⁰ Agricultural Marketing Co-operative Societies.

5.4 The households' socioeconomic changes from 2015 to 2017

From 2015 to 2017 many socioeconomic factors have changed for the 44 households including their income, agricultural practices, yields and marketing. First, I will analyse how the household's income groups have changed from 2015-2017 followed by an analysis on the other socioeconomic factors that may have influenced the income changes.

From my questionnaires in 2018 I got a greater insight in the households' FFLG memberships. As can be seen on table 10 and 11 below, most of the 44 households joined their FFLG 2-3 years ago with the wish for a higher agricultural output and for the MIG and HIG the most common reason was 'social reasons'.

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Years of membership in FFLG				
2	30%	30%	29%	30%
3	33%	40%	29%	34%
4	26%	10%	0%	18%
5	11%	20%	29%	16%
6	0%	0%	13%	2%

Table 10. Years of membership in FFLG (from 2017).

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
The main reason for joining the FFLG				
Market access	4%	10%	14%	7%
Social reasons	4%	40%	43%	18%
To become organic	26%	10%	14%	20%
Wish for higher agricultural output	55%	20%	29%	43%
To get help with my farm	7%	20%	0%	9%

Table 11. Reasons for joining the FFLG.

5.4.1 Increased incomes and a change in marketing methods

For the whole sample of 44 households, the average total income increased from being 1,600,591 TZS in 2015 to 3,423,705 TZS in 2017. Compared to the average of 1.9 USD/day in 2015, the households had 4.1 USD/day in 2017. That is an income increase by +114% on an only two-year period. The distribution of total incomes is illustrated as below.

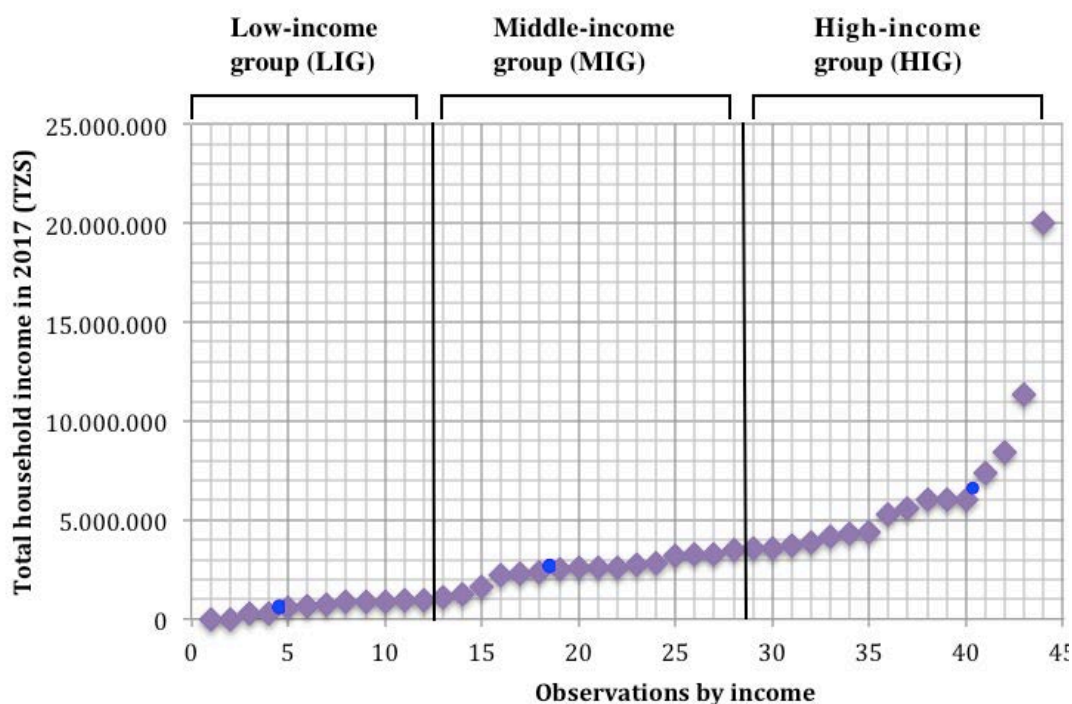


Figure 7. Scatter diagram showing the total incomes from 2017 and the “new” groups as based on 2015 income intervals. The blue dot represents the average income in the group.

The scatter diagram above shows a similar graduation as the scatter diagram for 2015 in figure 6, with one household having a significantly higher income than the rest. However, the size of the LIG has decreased to 27% of the sample, while the MIG and HIG both increased to a 36% share. This is a sign that more households have become wealthier. The most outstanding increase from 2015-2017 is not seen in the crop farming income (+69% on average) but in the non-farm income (+219% in average), as can be seen in table 12. Not only have the average non-farm income increased, so has the number of households with non-farm occupations, which increased by +17% from 2015 to 2017.

Income source	2015 (TZS)	2017 (TZS)
Crop farming	1,087,523	1,836,250
Non-farm (employment, business and 'other')	400,909	1,280,545

Table 12. Average incomes from the different occupation types for the 44 households in 2015 and 2017.

2015 \ 2017	LIG	MIG	HIG
LIG	<u>37%</u> → 30% → 33%		
MIG	0%	<u>50%</u> → 50%	
HIG	28%	44%	← <u>28%</u>

Table 13. Percentage of households from each group that either remained in their income group (underlined) or changed group from 2015 to 2017 according to the 2015 income intervals. The shift directions are illustrated with arrows.

The changes in the total incomes from 2015 to 2017 for the 44 farmer households show that the former income group divisions have been “broken” as illustrated in table 13 above, and the majority (61%) of the 44 households shifted to another income group in 2017 than they did in 2015. Interestingly, the majority of the households in the LIG as well as 50% in the MIG, shifted to higher income groups from 2015 to 2017, while the majority in the HIG have shifted to lower income groups. As mentioned in section 3.3 all of the six interviewed households are among the ones shifting income groups from 2015 to 2017. The total income increases for the 44 individual households, which form the basis for the group shifts, are significantly varied and can be viewed in details in appendix E. Here, it can be seen that all of the seven households in the HIG’s total income decreased from 2015 to 2017, while it increased for the majority of the households in the LIG and MIG. It is therefore interesting to examine how the groups have changed from 2015 to 2017 in terms of occupation, marketing, farming practices, yields and participation in training activities, to evaluate how those changes could be related to the major income changes. First, an overview of income, occupation and marketing changes in the original income groups (based on their 2015 incomes), is presented below.

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Average income, range (TZS) and percentage difference since 2015				
Total income	3,273,630 (300,000-20,000,000) +797%	4,168,500 (2,200,000-8,400,000) +100%	2,938,571 (300,000-7,370,000) -48%	3,423,705 (300,000-20,000,000) +114%
Extreme poverty and difference since 2015 in percentage point (pp)				
<1,9 USD/day	44% (-56 pp)	0% (-30 pp)	29% (+29 pp)	34% (-34 pp)
>1,9 USD/day	56% (+56 pp)	100% (+ 30 pp)	71% (-29 pp)	66% (+34 pp)
Occupation income's share of total average income and difference since 2015 in percentage point (pp)				
Crop farming	62% (-3 pp)	35% (-22 pp)	56% (-19 pp)	54% (-14 pp)
Livestock	6% (+4 pp)	11% (-5 pp)	15% (+12 pp)	9% (+2 pp)
Employment	7% (-9 pp)	14% (-6 pp)	0% (-14 pp)	8% (-8 pp)
Business	4% (-4 pp)	29% (+25 pp)	23% (+15 pp)	13% (+6 pp)
Other	21% (+12 pp)	11% (+8 pp)	6% (+6 pp)	16% (+14 pp)
Marketing method (and difference since 2015 in percentage point (pp))				
Local open market	44% (+14 pp)	100% (+60 pp)	71% (+28 pp)	61% (+26 pp)
Middleman	44% (+9 pp)	0% (-40 pp)	29% (-14 pp)	32% (-5 pp)
AMCOS	4 % (+4 pp)	0% (-10 pp)	0%	2%
Other	8% (-27 pp)	0% (-10 pp)	0% (-14 pp)	5% (-21 pp)
Agricultural production sold (and difference since 2015 in percentage point (pp))				
Average share sold of total production	70% (+16 pp)	78% (+11 pp)	73% (-16 pp)	74% (+11 pp)
Joint marketing (and difference since 2015 in percentage point (pp))				
Yes	41% (+34 pp)	30% (+20 pp)	29% (-13 pp)	36% (+22)
No	59% (-34 pp)	70% (-20 pp)	71% (+13 pp)	64% (-22)

Table 14. Changes in income, occupation and marketing from 2015 to 2017.

The above table 14 shows some interesting changes from 2015 to 2017 as well as patterns for each of the groups. Overall, the households have increased their incomes significantly, with an average of +114% for the whole sample. The households in the LIG have the highest average income increase by +797%, followed by the MIG with +100% and the HIG with a decrease of -48%.

Due to the increased incomes, a majority (66%) of the 44 households were not considered extreme poor in 2017, which is a significant increase from the 32% in 2015. In 2017, the households in the LIG had between 0-13.6 USD/day, the MIG 2.6-10 USD/day and the HIG 0.4-8.9 USD/day, which again illustrate the increased success for the LIG and MIG. The biggest change in the extreme poverty status is in the LIG, where 56% have climbed above the extreme poverty line from 2015 to 2017, including the household with the highest 2017 income in the whole sample.

With the income and poverty changes there is a division between the LIG and MIG with increased income and reduced extreme poverty and the HIG with decreased income and increased extreme poverty; this division is not only seen in incomes but also on some of the other parameters in table 14, which could indicate that these parameters have an impact on the income changes. One of these parameters is the average percentage sold of the agricultural production, where the LIG and MIG have sold a higher share in 2017 than in 2015 and the HIG a lower.



Local open market, Unguja. Photo: Frederikke Mynthe Bugge Søyland (2018)

Another is their participation in joint marketing, which again has increased for the LIG and MIG and decreased for the HIG. A farmer household representative (FHR) from the LIG (appendix C1) connected the household's increase income with joint marketing. A third parameter is the marketing method, where an increased share of the sample sold their agricultural production at the local open market in 2017 in replacement of using a middleman, AMCOS or 'other' marketing methods. This change could have impacted the crop farming income, which increased as seen for the whole sample in table 12.

Interestingly, the average crop farming income's share of the total household income has decreased for all the groups, while the share of non-farm income from business and 'other' have increased. Five out of the six interviewees did not have any non-farm incomes, but wished to have so as they believed the income would be beneficial for their farm and livelihoods.

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Increased income since joining the FFLG				
Yes	93%	100%	100%	95%
No	7%	0%	0%	5%
If yes, it was used for... (multiple answers possible)				
Sending children to school	84%	90%	100%	88%
House improvements	64%	60%	86%	67%
Food security	68%	80%	86%	74%

Table 15. Increased income since joining the FFLG.



Children in school in Pemba. Photo: Laurine Schønning Kjærulff (2018)

The above table 15 is based on answers to questions that were only asked by me in 2018 and therefore not included in the baseline questionnaire. The distribution supports the calculations presented in table 14, that the households have experience increased income. The income increase in above table, however, is concerning since they joined their FFLG which therefore can be before 2015, as some households have

been members for up to 6 years (see table 10). Many of the households have used their increased income for all the three possible choices in table 15, but with the majority using it for sending their children to school.

5.4.2 Increased yields and organic farming practice

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Average farm size (and range and percentage difference since 2015) and farming practices (and difference since 2015 in percentage point (pp))				
Farm size (acre)	2 (0.3-5.5) -14%	1.9 (0.25-4.75) -12%	2 (0.85-4.5) +24%	1.85 (0.25-5.5) -16%
Organic	85% (+27 pp)	80% (+20 pp)	86% (+27 pp)	84% (+26 pp)
Non-organic	0% (-4 pp)	0% (-10 pp)	0% (-14 pp)	0% (-7 pp)
Both	15% (-23 pp)	20% (-10 pp)	14% (-13 pp)	16% (-19 pp)

Table 16. Change in farm size and farming practices from 2015 to 2017.

Common for the whole sample group is that more households have become entirely organic farmers (+26 pp since 2015) and that there were no entirely non-organic farmers left in the sample group in 2017, as shown in table 16 above. Furthermore, the average farm size for the sample decreased.

As can be seen on table 17, which is also based on elements in the questionnaire that was not in the baseline, the vast majority of the households have experienced a higher yield since they joined their FFLG. Most of the households answered that the reasons for the increase were the use of organic manure and compost and water management. One of the interviewed FHRs (appendix C1) related the household's increased yields to increased knowledge and expansion of farm, while an interviewed FHR (appendix C4) with decreased yields related it to the extreme rainfall, which destroyed the crops.

The average household's farm in 2017 is characterised by organic manure and compost, intercropping, crop rotation and mulching and some households keep records and do farm planning. The daily working hours in the field are, as seen in table 17, almost 4 hours on average for the whole sample and the daily expenses almost 1,000 TZS³¹. The expenses for OA should be lower than CA due to the low or lacking input costs by having locally available inputs, and a conversion to OA from CA would therefore often result in more financial security.

³¹ As those parameters were not included in the baseline questionnaire conducted in 2016, it is not possible to measure the changes and their potential relation to the socioeconomic changes e.g. in income and yield.

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Experienced higher yields since joining the FFLG				
Yes	93%	100%	100%	95%
No	7%	0%	0%	5%
Average yield increase³²	246%	398%	185%	272%
Reasons for higher yield (possible with multiple answers)				
Water management	72%	100%	100%	83%
Organic manure/compost	96%	100%	100%	98%
Crop rotation	52%	80%	57%	59%
Intercropping	52%	70%	29%	52%
Other	4%	0%	0%	2%
Farm working hours and farm expenses				
Average working hours per day	03.05	4	03.05	03.09
Average farm expenses per day (TZS)	718	1,526	551	913
Farm practices used (multiple answers possible)				
Organic manure/compost	96%	100%	100%	98%
Intercropping	78%	70%	43%	70%
Crop rotation	85%	80%	100%	86%
Mulching	85%	100%	100%	91%
Record keeping	44%	80%	71%	57%
Farm planning	70%	90%	71%	70%

Table 17. Yield and farming characteristics.

³² Based on the respondents' own statements and estimations.

Organic yields' percentage change 2015-2017	LIG	MIG	HIG	Whole sample
Green vegetable	+167% (n=6)	+966% (n=3)	-12% (n=1)	+223% (n=10)
Tomato	+10% (n=7)	-20% (n=2)	+942% (n=1)	+49% (n=10)
Okra	+142% (n=2)	+8,388% (n=2)	N/A	+898% (n=4)
Eggplant	+151% (n=3)	N/A	N/A	+151% (n=3)
African eggplant	N/A	-44% (n=1)	N/A	-44% (n=1)
Cassava	+17% (n=9)	+64% (n=2)	+400% (n=2)	+44% (n=13)
Banana	+73% (n=7)	+312% (n=2)	+220% (n=1)	+156% (n=10)
Rice	+89% (n=2)	+200% (n=1)	N/A	+131% (n=3)
Cucumber	N/A	N/A	N/A	N/A
Green pepper	N/A	N/A	-44% (n=2)	-44% (n=2)
Watermelon	N/A	N/A	N/A	N/A
Yams	N/A	N/A	N/A	N/A
Maize	N/A	N/A	N/A	N/A
Onion	N/A	N/A	+900% (n=1)	+900% (n=1)
Total average	+93% (n=36)	+1,409% (n=13)	+401% (n=8)	+246% (n=57)

Table 18. The average organic yield change for crops that were cultivated by the same household in both 2015 and 2017. N/A = no observations.

As can be seen on above table there are 57 observations of organic crops cultivated by the same household in both 2015 and 2017. Their yields are therefore comparable between the two years, and the table emphasizes that their yields have changed remarkably. Yet, some yield data from 2015 and 2017 can be biased e.g. due to misunderstandings or miscalculations either by the FHR or the questionnaire responsible³³. Other reasons for the yield changes could be pests and diseases, which all of the six interviewees have experienced or failed harvest which affected four of the six interviewed households. Most of the crops have increased to a degree, where it would be wrongful to assume that they have not increased at all. By that I mean, that even an increase of, say, +8,388% on average for the two households cultivating okra in the MIG is rather unlikely and extreme, the possibility that there at least has been an increase, even to a lower degree, is highly convincing. Again, the number of observations for each of the average yield changes, plays a role in the reliability of the changes. Here, the four decreased average yields are based on either one or two observations, which makes them questionable though possible. The organic cassava and banana

³³ A Tanzanian company carried out the 2015 questionnaires, while my translator Said and myself carried out the 2017 questionnaires. There were incidents where the respondents could not provide a yearly crop production, but instead an estimate per week or month, which afterwards were calculated to a yearly production (with the seasonality included).

yields for the LIG have the most observations and will thus also be considered the most reliable. It is here a good sign for the project that those two average yields have increased from 2015 to 2017. The average yield for all the crops in the sample increased significantly (+246%). Furthermore, as mentioned in section 2.2, studies show that organic yields will increase a few years after the organic conversion (Seufert *et al.*, 2012), which is also the case for most the yields in table 18.

The observations in above table are, as mentioned earlier, only based on the organic crops cultivated by the same household in both years, but many of the households only cultivated the



Organic tomatoes on Unguja. Photo: Laurine Schønning Kjærulff (2018)

organic crop in one of the years, and their data could thus not be used. One of the reasons, why only a few of the households have continued to cultivate the same organic crops, could be that many households changed their agricultural practices, mainly from both non-organic and organic in 2015 to entirely organic in 2017, and the yields for the former non-organic crops are thus not included in above calculations. In 2017 tomato was the most cultivated organic crop among the 44 households (59%) followed by green vegetable (50%), which is a shift from 2015, where cassava and banana were the most popular, however, they follow just after green vegetables in the ranking.

5.4.3 Increased social activities

The below table emphasizes that most of the households have increased their social activities, since they joined their FFLG, with the exception of two households in the LIG. Most of the six interviewees stated that they have very good social relations to the other members in their FFLG, which for instance have led to more friends and more helping hands in their farm.

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Increased social activities since joining the FFLG				
Yes	93%	100%	100%	95%
No	7%	0%	0%	5%

Table 19. Social activities.

5.4.4 The socioeconomic changes addressed in a Sustainable Livelihoods Framework

Through the interviews and questionnaires it is possible to make a Sustainable Livelihoods Framework (SLF), though excluding one of its dimensions. I will present a single framework based on the statements in the questionnaires and interviews with three organic FHRs from the LIG (see appendix C1-3), who experienced increased incomes from 2015 to 2017.



Household (appendix C3), Mariam with her children. Photo: Laurine Schønning Kjærulff (2018)

Vulnerability Context: The three interviewed households with increased incomes from 2015 to 2017 are significantly vulnerable, as they have explained during the interviews. The climate changes, as a trend, affect their crops' health, as do shocks such as pests and diseases. For two out of the three households this have resulted in failed harvests and thus impacted their food security and income negatively (yet, still resulted in increased incomes from 2015 to 2017). One of

the households is affected by severe illness (shock) since 2015, which has slowed down the farm work in their field significantly and lowered their FFLG participation level. All of the three households are furthermore seasonal vulnerable, as their income from crop farming (which is their main income source) is depending on the seasonality of the crops. This makes them financial vulnerable, as the periods with the most income typically not is the period where they need money the most³⁴.

Livelihood Assets: The *Human Capital* is relatively high as the three interviewed households have learned a lot about organic farming (and farming in general) from their FFLG, organisations like UWAMWIMA and their parents (indigenous technical knowledge). Furthermore, they have all graduated primary school, and most of household members also continued into secondary school. However, this capital is lowered due to one FHR not being able to work. The *Social Capital* is high as they are all members in an FFLG and have good social networks and good relations to the other members in their FFLG. The *Natural Capital* is also high due to organic farming's benefits to the

³⁴ All six FHRs explained that they need money the most during Islamic holidays and for school start.

nutrient cycles in the soil. The *Physical Capital* is low as the access to transportation is limited and two out of the three households don't have access to enough water for their fields and households. Yet, they do have houses, however two out of three are without kitchen, toilet and electricity. The *Financial Capital* is also low as the three households' average total income (flow) of 253,000 TZN in 2015 is much lower than the whole sample's average of 1,600,591 TZN. On the other hand, they all do have financial stocks in cash savings³⁵ and livestock³⁶ and financial safety through the possibilities to obtain a loan from their FFLG. The *Livelihood Assets* pentagon is illustrated below.

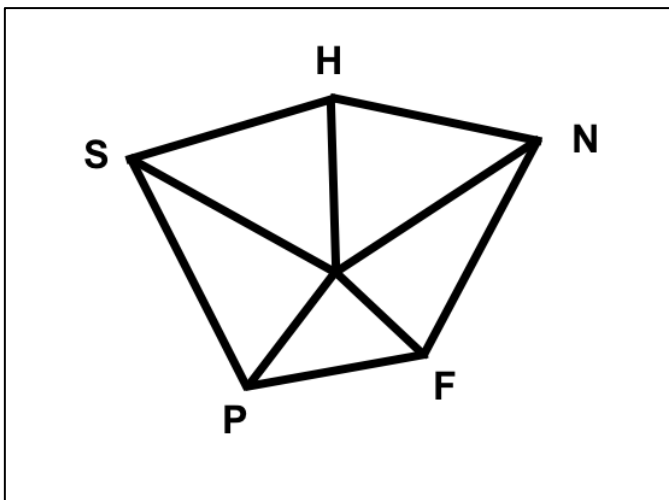


Figure 8. *Livelihood Assets* pentagon. H = Human Capital, N = Natural Capital, S = Social Capital, P = Physical Capital and F = Financial Capital.

The three households' *Livelihood Strategy* is to be members in an FFLG as farmers in order to increase their farming knowledge, yields, food security and incomes. In 2015 one of the households supported their livelihood strategy with non-farm employment, and between 2015-2017 one household got income from livestock. Their primary *Livelihood Outcomes* have been a significant income increase to 3,500,000 TZS in 2017 on average, which is an almost +1,300% increase from 2015. Furthermore, they have all increased their food security. So, despite their vulnerabilities and relatively low *Physical* and *Financial Capitals*, their *Livelihood Strategies* proved to be very successful, as seen in their *Livelihood Outcomes*, due to their high *Human, Social* and *Natural Capitals*. The three households' livelihoods can thus be categorised as sustainable.

³⁵ One household has a 230,000 TNZ savings and one saves 180,000 TNZ per year.

³⁶ One household has 10 chickens, one has 15 chickens and one has one cow.

5.4.5 Partial conclusion to the socioeconomic changes

Summed up, the sample of the 44 households have had an average increase in their total income by +114% from 2015 to 2017, where the crop farming income's share has decreased, while the business and 'other' income's share have increased. Furthermore, the extreme poor households have been reduced significantly from 2015 to 2017. The income increase have resulted in the majority of the households sending their children to school, improving their house as well as increasing their food security. However, it was only in the LIG and MIG that the total incomes increased, as all the seven households in the HIG had decreased income. During those two years, an increased number of households sold their agricultural surplus on the local open market and did joint marketing. In fact, the households in the LIG and MIG have sold an increased share of their total agricultural production, while it decreased for the HIG. There has further been an increase in households doing entirely organic farming (85% in 2017) and their organic yields have also increased on average. Therefore, there could be a correlation between the increased incomes and increased organic farmers and yields, as well as the changed division of marketing methods and share of production sold. The increased yields and increased share of agricultural production sold could further indicate that the food security in the majority of the households has increased. The reasons for the changes and their inter-correlation will be further discussed in section 6.1.

The results further address two of the Zanzibar project's indicators. For the first indicator, "*By 2018 at least family members of 20 FFLGS have increased their income with 20% compared to project initialization*", the results from the questionnaires have shown that 27 of the 44 households (61%) have increased their total incomes with more than +20% from 2015 to 2017 and is representing 17 FFLGs³⁷. Keeping in mind that the sample represent the whole baseline population of 310 households, 61% of the 39 FFLGs represented in the baseline equal 24 FFLGs that would have had an increase total income of more than +20% from 2015 to 2017. This progress unveils good chances that they indicator will be met by the end of 2018. For the second indicator, "*By 2018 at least 20 FFLG have established joint marketing and are selling their bulked produce to the market*", the results show that 16 out of the 44 households (36%) were doing joint marketing in 2017, which represents 11 FFLGs. For the baseline population, these results would represent 14 FFLGs, and thus under the required 20, but there are, however, still time left for the indicator to be met before the project is finalized.

³⁷ The income from the sale of crops increased by more than +20% for 52% of the households (16 FFLGs).

5.5 Participation in the project

2017	LIG (n=27)	MIG (n=10)	HIG (n=7)	Whole sample (n=44)
Participation in training activities and increase since 2015 in percentage points (pp)				
Yes	100% (+70 pp)	100% (+10 pp)	100% (+57 pp)	100% (+55 pp)
No	0% (-70 pp)	0% (-10 pp)	0% (-57 pp)	0% (-55 pp)
Household's participation level in FFLG				
Low	26%	10%	0%	18%
Medium	48%	40%	57%	48%
High	26%	50%	43%	34%
Participation in FFLG activities				
1-2 times/month	33%	40%	57%	39%
3-4 times/month	41%	50%	14%	39%
7-8 times/ month	19%	10%	14%	15%
12-16 times/month	7%	0%	14%	7%
Presented ideas to the FFLG				
Yes	70%	100%	100%	81%
No	30%	0%	0%	19%
If yes, were they implemented?				
Yes	95%	100%	100%	97%
No	5%	0%	0%	3%

Table 20. Participation.

The LIG, which according to table 14 had the highest average total income increase, is also the group with the highest increase in participation in training activities from 2015 to 2017 as can be seen in table 20 above. Therefore those two parameters could be related, as the training activities can provide more knowledge for farming and thus result in better and bigger surplus for selling. In fact, 100% of the sample's households had participated in training activities by 2017.

Furthermore, the HIG has the highest share of households among the groups, participating in FFLG activities between 7-8 or 12-16 times per month (28%). Yet, the most common activity level for all the groups is between 1 to 4 times per month. When asked about their level of participation in their FFLG (low, medium or high), the LIG has the biggest share of low participation levels while the biggest share of middle and high participation level is seen in the HIG, where there were no

households with low participation, followed closely by the MIG. Furthermore, in the HIG and MIG, all the FHRs had presented ideas in their FFLG, whereas this only counted 70% of the FHRs in the LIG.

In order to be able to determine the FFLGs' level of participation based on Jules Pretty's (1995) seven types (see figure 2), more insight in the different FFLGs is needed. Therefore the six interviewed FHRs were asked questions about their FFLG useful to determine their participation types, which will represent six different FFLGs. Not all the FFLGs are the same, however they do have similar characteristics, as they all have between 15-30 households per group, a facilitator and does activities and rotational visits to other FFLGs. All of the six interviewed FHRs stated that the decision-making in their FFLG is shared among all its members e.g. when implementing new ideas to the group. Furthermore, they stated that all of their FFLGs' members participated in forming the group plans and most of the interviewees also stated that their FFLG is highly independent and that the FFLG facilitator was chosen through voting by the its members.

This makes the type of participation in the FFLG at least to be number 6, *Interactive participation*, due to the members' participation in plans and the groups' interdisciplinary and structured learning processes. Yet, two of the six represented FFLGs in the interviews (appendix C4 and C6), also have elements of the seventh (and thus highest) level of participation, *Self-mobilization*, as they have received support from the government in term of one loan for the FFLG of 3,000,000 TZS and one donation of 700,000 TZS. However, the FHRs in both interviews were the FFLG's facilitator, and as the other four FHRs were not facilitators, they might not have known, if their FFLG also received support from the government.

6. Discussion

The socioeconomic changes and the participation in the project can have been affected by an endless number of reasons. In this discussion I include some aspects of possible reasons, yet it should be noted that it is impossible to cover all plausible aspects.

6.1 Reasons for the socioeconomic changes from 2015 to 2017

The sample's total income increase from 2015 to 2017 by +114% on average, as well as the reduction of extreme poverty, can be caused by multiple factors. The project has, with its well-functioning FFLGs, a solid fundament for increasing the household's crop farming income, as the groups aim at facilitating knowledge and support for increasing yields, hence increased surplus to sell, and further provides possibilities for joint marketing. The crop income increase by +69% on average for the sample could therefore be a direct result of the project's success. In an interview with FHR Bisambe Kombo Narusha (BKN) (see appendix C1) from the LIG, she explained the reasons for her high crop income increase from 59,000 TZS in 2015 to 2,200,000 TZS in 2017 (around +3,500%) as follows: *"the crops are getting better everyday, I get more knowledge and I expanded my field"* and further stated that she got access to transport (a non-project related factor), so she could transport her crops to the market herself instead of using a middleman, which also contributed to her success. The same household began to participate in joint marketing between 2015 and 2017, which, as BKN said, resulted in *"more income, plans, friends and experiences, and was very useful for our farm"*.

The correlation between the project and increased incomes is further supported by the questionnaire for 2017, where 95% of the respondents said their income increased since they joined their FFLG. On the other hand, a non-project related (partial) cause of the crop farming income crease could be the government's (RGoZ's) increasing initiatives in the agricultural sector as mentioned in chapter four. The rural livelihoods thus have an increasing priority for the government. However, if agreeing with Robert Chambers' (1986) opinion that the rural people are the least benefitting part of society from development in the agricultural sector, the RGoZ's initiative would most likely not have affected the rural farmer households in the sample. Yet, other non-project related factors such as price fluctuations and the climate, could have affected the crop farming income.

The major reduction of extreme rural poverty also points to the project as the causing factor. As mentioned earlier, rural poverty was estimated to have increased with 8 percentage points on Pemba and decreased with 3 percentage points in Unguja in the years 2010 to 2015. In my research period from 2015 to 2017 the extreme poverty has decreased more on both islands and not only on Unguja. This comparison is however rather biased due to major differences in sample sizes as well as different time periods.

The +219% average increase of non-farm income as well as the +17% increase of households with non-farm occupations, on the other hand, has to a greater extent probably been related to non-project factors. These include the on-going rural transformation in SSA, where both incidences and volumes of non-farm incomes are increasing in the rural households. In 2015 the sample's non-farm income had a 25% share of the total average income, which increased to a 37% share in 2017 and thus evolves towards the average 45% share in the rural households in whole SSA. The Tanzanian GDP per capita growth of +3.5% from 2010-2015 (The World Bank, 2018) could also be reflected in the household's increased non-farm incomes as well as their crop farming incomes. The reason why the increases probably mostly are related to these non-project factors is that the Zanzibar project does not focus directly on increasing non-farm incomes and occupations. On the other hand, there could be an indirect correlation between the increases and the project, as the households have increased their social networks through the FFLGs. A bi-product of social networks shows an increased frequency of job possibilities (Wolff & Moser, 2009). Ergo, the increased social networks for the farmers could have resulted in the increased non-farm income and occupations from 2015 to 2017.

As mentioned earlier, I believe some of the different socioeconomic changes could be positively or negatively correlated, especially due to the fact that the three different income groups, LIG, MIG and HIG, had to some extent different change patterns from 2015 to 2017. For the whole sample, the before mentioned average total income increase could be directly linked to the "boost" of households selling their crops at the local market in replacement of using middlemen as well as the increase of households doing joint marketing, as improved marketing can lead to higher earnings. The share of total agricultural production being sold in 2017 increased for both the LIG and MIG, which could be related to their increased incomes, as opposite to the decreases in the HIG's total incomes and share of total agricultural production being sold. Yet, again this is assumptions

difficult to prove, as they could be related either to other of the socioeconomic changes or the above mentioned non-project related factors.

The increased organic yields can be caused by their conversion to organic agriculture, and can have a direct correlation to the increased crop farming incomes. Increased non-farm incomes could further result in increased yields, as the opportunities for purchasing e.g. organic fertilizers and a water well for irrigation have increased. However, this is mostly when looking at the whole sample, as the LIG with the highest increase in average total income in fact is the group with the lowest increase in yields. On the other hand, this could be due to the fact that the yields in the LIG have far more observations than in the MIG and HIG, which makes the LIG yields more reliable, while the other's yield data could be more extreme and questionable. Further reasons for increased yields are, as the FHRs responded in the questionnaires, due to knowledge from the FFLG regarding e.g. water management and organic manure and compost.

At the same time, the yields in 2015 and 2017 do not necessarily only depend on the success of the FFLGs, but could also be affected by non-project factors such as the climatic conditions. Sharifa Saidi (SS) from the HIG had a decreased income and yield from 2015-2017, and in the interview with her (see appendix C4), she explained that *“there was so much rain and then my income decreased because the rain destroyed my crops.”* The earlier mentioned climate changes in Zanzibar are probably what SS had experienced on her farm, and she is not the only one. According to five out of the six interviewees, climate changes have affected their crops negatively due to stronger precipitation and higher temperatures. Therefore, it seems that most reasons for increased yields would be project related, while the decreased yields could be more related to non-project related factors.

The socioeconomic changes from 2015 to 2017 can further be related to the households' participation levels, which will be discussed in the next section.

6.2. Reasons for the participation in the project and its correlation to the socioeconomic changes

The participation in training activities increased from 2015 to 2017, and most significantly for the LIG. This could be related to the LIG's high average total income increase, as the training activities provide knowledge useable for increasing yields and marketing of surplus.

The households' participation levels could further be related to their incomes in 2015, as the MIG and HIG have the highest levels of participation while the LIG has the lowest. However, these participation levels are representing 2017 and not 2015 and are further biased by being subjective and thus difficult to compare.

In three out of the six interviews the FHRs were asked whether their participation level in their FFLG had increased or decreased from 2015 to 2017. Here, two of them (from the LIG and HIG respectively) said that their participation had increased (see appendix C2 and C6), with the respective reasons that the farm had expanded and thus more people from the FFLG helped on the farm, and for the other FHR it was mainly due to the fact that he was the facilitator of the group. Those reasons were therefore related to the project. They furthermore stated that their high participation has a great impact on their social life and farm productivity. One FHR from the LIG (C3) had decreased her participation from 2015 to 2017, but with the valid reason that she has been ill during the last couple of years and was thus not able to participate. This reason, on the other hand, is not project related.

The FFLGs participation types – according to Jules Pretty's (1995) typology of participation – were based on statements from only six respondents (the interviewees). Therefore the two estimated types, *Interactive participation* and *Self-mobilization* do not necessarily represent all of the FFLGs in the project. Further, the respondents' answers could be biased by the fact that UWAMWIMA employees were present during the interviews, which could make them refrain from sharing possible negative aspects of their FFLGs. However, this is obviously impossible to prove.

The participation in the FFLGs could be correlated to other socioeconomic changes than the income. By looking at the whole sample, the increased participation in training activities as well as the relatively high participation levels could be correlated to the increased social activities as well as the increased organic yields. The two interview respondents chosen due to their high

participation levels, stated that their participation level was a result the FFLG members helping each other in their respective farms, which increased the farm productivity and yield as well as the social activities. However the yields would most likely still have increased, due to the participation, if the FFLG had focused on another agricultural practice such as conventional farming.

The overall success of the project in Zanzibar can to a high degree be correlated to the participation in the FFLGs, especially if keeping Pretty's (1995, p. 1,251) statement in mind, that participation "*...is one of the critical components of success*".

6.3 Perspectives on my research

The results of my research are highly affected by my choices in methods and analysis calculations, as well as the available resources for conducting the fieldwork in Zanzibar.

To be able to see the real affects of a conversion to OA, I should have conducted a questionnaire prior to the households' enrolment in the FFLGs (and before they converted to OA). This could have functioned as my baseline. However, as I can't travel back in time, this was not possible and the baseline from 2015, when they had already become members in the FFLG and most of them had converted to OA, was also a strong alternative.

For my fieldwork, I could have chosen to include more households for the questionnaires as well as more interviews. This could undoubtedly only have improved my research, the reliability of the results and the representativity to the baseline population. However, as I was the only one fully responsible for conducting the fieldwork (though supported and assisted) and I had a limited time frame of three months, this would not have been possible. However, I could have chosen a looser interview method as opposition to the semi-structured method, which could have led the analysis in different directions, but whether this would have benefitted my analysis is impossible to say.

My analysis of the results could have been done in numerous ways. I chose to divide the households based on their incomes in 2015, but I could also have chosen another parameter, such as participation levels and agricultural practices. This would obviously have provided me with different results for the groups, through the results from the whole sample naturally would have remained unchanged.

Finally, I believe there is a chance that the data from the questionnaires, in 2015 and 2017 respectively, are (slightly) biased due to the fact that they were not conducted and collected by the same person. As known, I was in charge of the questionnaires representing 2017 data, but Abdallah Ramadhani, a coordinator in Tanzania Alliance for Biodiversity, was in charge of the baseline collection of the 2015 data. The differences could lie in our respective fieldwork methods, but also that he is a local and I am a white-skinned foreigner. This could have affected how the respondents answered the questionnaires, as they might have been more open to a local person than a foreigner. However, this is solely assumptions interesting to dwell on, but cannot be proven.

Robert Chambers (1981, p. 9) points out the biases, that can lie in doing research on poor rural people, as he stresses, “*poverty in any country may be a subject of (...) shame, something to be shut out*”. In reality this could be a bias to the questionnaires in both 2015 and 2017, especially regarding incomes, but I am of the belief that my results were biased to a higher degree due to my background as a foreigner.

Despite the possible biases, my results and analysis unveil strong evidence of positive socioeconomic changes from 2015 to 2017 for the 44 households as well as for their participation in the project.

Conclusion

The approach to my first research question, *which socioeconomic effects does a conversion to organic agriculture have on small-scale family farmers in developing countries?*, is entirely based on the findings from my case study, being the project in Zanzibar. Here, I can conclude that a conversion to OA for 44 farmer households have increased most of their incomes (which addresses the project's first indicator), reduced the number of extreme poor households, increased organic yields, increased their share of total agricultural production being sold (an indicator for enhanced food security), increased the number of households doing joint marketing (which addresses the project's second indicator) as well as increased social activities. These changes are based on the average for the whole sample's socioeconomic changes from 2015 to 2017. By looking at the households divided into their income groups, LIG, MIG and HIG, the most significant differences were that only the LIG and MIG increased their incomes (and reduced their share of extreme poor households), while the opposite change was seen in the HIG. The significant income increases in the LIG were analysed through a Sustainable Livelihood Framework, which e.g. took the households' vulnerabilities into account, and concluded that their livelihoods were sustainable.

However, it is debateable to which degree the socioeconomic improvements are caused by the households' conversion to OA, their participation in the project through the FFLGs or non-project related factors. My second research question, *how are these socioeconomic effects correlated to the farmer households' level of participation in the development project?*, addresses this issue. I here found that the share of households participating in training activities went from 50% to 100% from 2015 to 2017 and that most of the households had a medium to high level of participation in their FFLG in 2017 (with varying frequencies of participation in FFLG activities), which is also reflected in the fact that most households had presented ideas in their FFLG. The participation can be related to socioeconomic changes to the extent that the more they participate the more knowledge and experience on farming and marketing they get through their FFLG, as well as expanding their network. This increased knowledge, experience and network could lead to increased yields and surplus, and thus generate more income. However, the households with high participation levels have not necessarily increased their incomes from 2015 to 2017. The participation levels can furthermore be related non-project related obstacles such as illness.

The reasons for the socioeconomic changes were discussed, where project related and non-project related reasons were evaluated. Here, the project related factors accounted for most the possible reasons to e.g. crop farm income and yield increases, while non-farm income and yield were also linked to non-project related factors such as rural transformation, climate changes and price fluctuations.

The FFLGs for the six interview respondents were estimated to fit into the two best types of participation according to Pretty (1995), *Interactive participation* and *Self-mobilization*, due to the members' participation in the organisational structures and processes and their support from the government.

To sum up, the overall impacts of the project in Zanzibar proved to be positive and possibly sustainable for the 44 participating households. My findings for this sample represent the whole baseline population of 310 households. The success of the project can thus be used as a good example and inspiration for future development projects in developing countries; both with regard to the project's focus on organic farming and their FFLG approach.

Bibliography

Articles

- Baum, Warren C. & Tolbert, Stokes M. (1985). *Investing in development: Lessons of World Bank experience*. Published in *Development of Southern Africa*, volume 3, number 2, pp. 199-218.
- Barrett, C. B., Reardon, T. & Webb, P. (2001). *Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics and policy implications*. Published in *Food Policy*, volume 26, pp. 315-331.
- Chambers, Robert. (1981). *Rural Poverty Unperceived: Problems and Remedies*. Published in *World Development*, volume 9, pp. 1-19. Pergamon Press Ltd., Great Britain.
- Collier, Paul. (2007). *Africa's Economic Growth: Opportunities and Constraints*. Published in *African Development Review*, volume 19, number 1, pp. 6-25.
- Das, J. K. & Mazumder, G. (2012). *Use of Indigenous Technical Knowledge for Sustainable Agriculture*. Published in *Environment & Ecology*, volume 31, number 2, pp. 596-598.
- de Ponti, Tomek, Rijk, Bert & van Ittersum, Martin K. (2012). *The crop yield gap between organic and conventional agriculture*. Published in *Agricultural Systems*, volume 108, pp. 1-9. Elsevier B.V.
- Ellis, Frank. (2005). *Small-Farms, Livelihood Diversification and Rural-Urban Transitions: Strategic Issues in Sub-Saharan Africa*. Prepared for the Research Workshop on The Future of Small Farms, 26-29 June 2005, UK.
- Ellis, Frank & Biggs, Stephen. (2001). *Evolving Themes in Rural Development 1950s-2000s*. Published in *Development Policy Review*, volume 19, number 4, pp. 437-448. Blackwell Publishers, United Kingdom and USA.
- Isham, Jonathan, Narayan, Deepa & Pritchett, Lant. *Does Participation Improve Performance? Establishing Causality with Subjective Data*. Published in *The World Bank Economic Review*, volume 9, number 2, pp. 175-200.
- Kenton, Nicole. (2014). *Participatory Learning and Action*. In *The SAGE Encyclopedia of Action Research*. SAGE Publications Ltd, London.
- Martini, E., Buyer, J. S., Bryant, D. C., Hartz, T.K. & Denison, R. F. (2004). *Yield Increases During the Organic Transition: Improving Soil Quality or Increasing Experience?* Published in *Field Crops Research*, volume 86, number 2, pp. 255-266. Elsevier B. V.
- Paul, Samuel. (1987). *Community Participation in World Bank Projects*. Published in *Finance and Development*, volume 24, number 4, pp. 20-23.

- Pretty, Jules N. (1995). *Participatory Learning for Sustainable Agriculture*. Published in *World Development*, volume 23, number 8, pp. 1,247-1,263. Elsevier Science Ltd. Pergamon. Great Britain.
- Röling, Niels (1985). *Extension Science: Increasingly Preoccupied with Knowledge Systems*. Published in *Sociologia Ruralis*, volume 15, pp. 269-290.
- Seufert, Verena, Ramankutty, Navin & Jonathan A. Foley. (2012). *Comparing the yields of organic and conventional agriculture*. Published in *Nature*, volume 485 pp. 229-234. Macmillan Publishers Limited.
- Schrama, M., de Haan, J. J., Kroonen, M., Verstegen, H. & Van Der Putten, W. H. (2018). *Crop yield gap and stability in organic and conventional farming systems*. Published in *Agriculture, Ecosystems and Environment*, volume 256, pp. 123-130. Elsevier B. V.
- Timmer, Peter C. (1988). *The Agricultural Transformation*. Published in *Handbook of Development Economic*, volume 1, pp. 275-331. Elsevier Science Publishers, Amsterdam.
- Theocharopoulos, A., Aggelopoulos, S., Papanagiotou, P., Melfou, K. & Papanagiotou, E. (2012). *Sustainable Farming Systems vs Conventional Agriculture: A Socioeconomic Approach*. Published in *Sustainable Development - Education, Business and Management - Architecture and Building Construction - Agriculture and Food Security*, pp. 249-272. Edited by Prof. Chaouki Ghenai.
- Wolff, Hans-Georg & Moser, Klaus. (2009). *Effects on Networking on Career Success: A Longitudinal Study*. Published in *Journal of Applied Psychology*, volume 94, number 1, pp. 196-206.

Books

- Aryeetey-Attoh, Samuel. (2010). *Geography of Sub-Saharan Africa*. Third Edition. Prentice Hall.
- Chambers, Robert. (1986). *Rural Development, Putting the Last First*. Longman, London.
- Chambers, Roberts & Conway, Gordon R. (1991). *Sustainable rural livelihoods: practical concepts for the 21st century*. *IDS Discussion Paper 296*.
- Degnbol-Martinussen, John & Engberg-Pedersen, Poul. (1999). *Bistand – udvikling eller afvikling: En analyse af international udviklingssamarbejde*. Mellempøkeligt Samvirke.
- Djurfeldt, Göran, Holmén, Hans, Jirstrom, Magnus & Larsson, Rolf. (2005). *The African Food Crisis: Lessons from the Asian Green Revolution*. CABI Publishing.
- Gordon, April & Gordon, Donald. (2007). *Understanding contemporary Africa*. Fourth edition. Lynne Rienner Publisher, Virginia, USA.
- Henman, Vanessa & Chambers, Robert. (2001). Chapter 27: Participatory Rural Appraisal. In Gijssbers *et al.*, *Planning Agricultural Research: A Sourcebook*, pp. 291-299. CABI Publishing, UK and USA.

Mellor, John W. (1966). *The Economics of Agricultural Development*. Cornell University Press.

Suksi, Markku. (2011). *Sub-State Governance through Territorial Autonomy: A Comparative Study in Constitutional Law of Powers, Procedures and Institutions*. Springer.

Factsheets

United States Department of Agriculture. (2015). *USDA Coexistence Fact Sheets: Conventional Farming*. Office of Communications, Washington, USA.

Reports

Anderson, Jamie, Collins, Marita & Musiime, David. (2016). National Survey and Segmentation of Smallholder Households in Tanzania: Understanding their Demand for Financial, Agricultural, and Digital Solutions. CGAP Working Paper.

DFID. (1999). *Sustainable livelihoods guidance sheets*.

FAO. (2001). *Guidelines for the Production, Processing, Labelling and Marketing of Organically Produces Food*. The Codex Alimentarius Commission. Joint FAO/WHO Food Standard Programme. Rome, Italy.

FAO, IFAD, UNICEF, WFP & WHO. (2017). *The State of Food Security and Nutrition in the World 2017. Building Resilience for Peace and Food Security*. Rome, FAO.

FiBL & IFOAM – Organics International. (2017). *The World of Organic Agriculture: Statistics and Emerging Trends 2017*. Edited by Helga Willer and Julia Lernoud. Switzerland.

IFAD. (2016). *Rural Development Report 2016: Fostering inclusive rural transformation*. Quintily, Rome, Italy.

Mikidadi, Astrid Johanne. (2011). *A Growing Link? Organic Farming and the Tourist Industry in Zanzibar*. MSc Thesis, Norwegian University of Life Science.

Ministry of Health, Community Development, Gender, Elderly and Children Tanzania, Ministry of Health Zanzibar, National Bureau of Statistics Tanzania, Office of the Chief Government Statistician & ICF USA (2016). *Tanzania Demographic and Health Survey and Malaria Indicator Survey 2015-2016*. Dar es Salaam, Tanzania & Rockville, Maryland, USA.

National Bureau of Statistics Tanzania & ORC Macro. (2005). *Tanzania: Demographic and Health Survey 2004-2005*. Tanzania and USA.

Organic Denmark (OD). (2015). *Empowerment of small holder farmer families through stronger civil society organisations, advocacy and market access in Zanzibar*. Application to The Civil Society Fund: Major Development Projects.

Scialabba, Nadia El-Hage & Hattam, Caroline. (2002). *Organic Agriculture, Environment and Food Security*. Environment and Natural Resources Service, Sustainable Development Department. Food and Agriculture Organizations of the United Nations, Rome.

The Revolutionary Government of Zanzibar (RGoZ). (2009). *Zanzibar Agricultural Transformation for Sustainable Development, 2010-2020: For Agricultural Productivity, Food Security and Sustainable Livelihood*. Final Draft.

The Revolutionary Government of Zanzibar (RGoZ). (2010). *Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP II) 2010-2015*. MKUZA II.

The World Bank. (2017). *Zanzibar Poverty Assessment*. The International Bank for Reconstruction and Development/The World Bank, USA.

Tanzania Organic Agriculture Movement (TOAM). (2015). *Analysis of Policy Gaps That Hinder Regional Trade of Organic Products in East Africa*.

UNEP & UNCTAD. (2008). *Organic Agriculture and Food Security in Africa*. United Nations Publication. New York and Geneva.

Vesterager, J. M., Ringo, D. E., Maguzu, C. W., Ng'ang'a, J. N. & Shao, P. (2017). *The RIPAT Manual – Rural Initiatives for Participatory Agricultural Transformation*. Second edition. World Vision Tanzania and RECODA. Arusha, Tanzania.

Watkiss, Paul, Pye, Steve, Hendriksen, Gerard, Maclean, Andrew & Bonjean, Muriel. (2012). *The Economics of Climate Change in Zanzibar*. Global Climate Adaptation Partnership, SUZA & IMS.

Websites

IFAD. (2018). *Why Rural People?* Visited on 03-05-2018. Link: <https://www.ifad.org/web/guest/investing-in-rural-people>

IFOAM. (2018). *Principles of Organic Agriculture*. Visited on 15-04-2018. Link: <https://www.ifoam.bio/en/organic-landmarks/principles-organic-agriculture>

Meteoblue. (2018). *Climate Zanzibar*. Visited on 08-05-2018. Link: https://www.meteoblue.com/en/weather/forecast/modelclimate/zanzibar_tanzania_148730

The World Bank. (2015). *FAQs: Global Poverty Line Updated*. Published on September 30, 2015. Visited on 10-05-2018. Link: <http://www.worldbank.org/en/topic/poverty/brief/global-poverty-line-faq>

The World Bank. (2018). *Data: Tanzania*. Visited on 20-05-2018. Link: <https://data.worldbank.org/country/tanzania>

UN. (2018). *Sustainable Development Goals*. Visited on 14-05-2018. Link: <https://sustainabledevelopment.un.org/sdgs>

Appendices

A. Questionnaire

Date:

I. Personal Profile of Respondent

Q1. Name: _____

Q2. Age: _____

Q3. Village/shehia: _____

Q4. District: _____

Q5. Name of FFLG: _____

Q6. Are you the head of household? (Je wewe ni mkuu wa kaya?)

i). Yes

ii). No

Q7. Total Number of Family Members (Idadi ya wana kaya):

Family Members' General Information (Taarifa za jumla za wana kaya):

Name	Sex	Relationship	Age	Occupation	Income

II. Data for Objective 1

Q8. What was your total household income (TZS) in 2017 (please state: per month/ year)?

Q9. What are the sources of your income?

Source of income	Amount of income (TZS)
1. Crop farming	
2. Livestock	
3. Employment	
4. Business	
5. Others	

Q10. What is your total current income (TZS) from the sale of vegetables? (per month or for 2017)

Q11. Which agricultural practices are you currently using?

- i) Organic /kilimo hai
- ii) Non- Organic/kilimo cha kawaida
- iii) Both /vyote
- iv) Others/ vingine

Q11a. Did you use the same agriculture practice in 2017 as you do now in 2018?

- i) Yes
- ii) No, I used: _____

Q12. Which crops did you grow in 2017?

Crops grown	Agricultural practices		Acres cultivated (2017)		Yield (2017) in kgs or bags	
	Organic	Non – Organic	Organic	Non – Organic	Organic	Non – Organic
1. Green vegetable						
2. Tomato						
3. Okra						
4. Eggplant						
5. African eggplant						
6. Cassava						
7. Banana						
8. Rice						
9. Cucumber						
10. Green pepper						
11. Water melon						
12. Yams						
13. Maize						
14. Onions						

Q13. Did you sell your produce in 2017?

- i) Yes
- ii) No
- iii) I do not know

Q14. If yes, where did you sell your products last year (2017)?

- i) Local open market/sokoni
- ii) Middle Man/dalali
- iii) AMCOS/vikundi vya ushirika
- iv) Others/sehemu nyingine

Q15. If yes, how many bags/kg did you sell?

No	Type of crop/Aina ya zao		Quantity sold	
	Organic	Conventional	Organic	Conventional

Q16. Did you sell your products (2017) bulked together with other members of your FFLG (joint marketing)?

- i. Yes
- ii. No

Q17. If yes, how many bags/kg did you sell in bulk?

No	Type of crop		Quantity sold in bulk	
	Organic	Conventional	Organic	Conventional

III. Data for output 1.3**Q18. At the moment, how would you describe your access to the local and national market in Zanzibar?**

- i) I have access/ ninalifikia
- ii) I have no access / silifikii
- iii) I have access, but/ nalifikia lakini: -----
- iv) I have no access, but/ silifikii lakini: -----

Q19. So far, have you ever participated in training activities in order to increase your advocacy capacity?

- i). Yes
- ii) No

Q20. If yes, which organization carried out the capacity building?: _____

Q21. What is the main reason that you joined the FFLG?

- i) Wish for higher agricultural output
- ii) To become organic
- iii) Social reasons
- iv) To get help with my farm
- v) Marked access
- vi) Others:

Q22. For how many years have you been a member and part of FFLG?: _____

Q23. So far, do you feel that the FFLG has resulted in a higher agricultural output?

- i) Yes
- ii) No

Q23a. If yes, for what reasons (water management, organic manure/compost, crop rotation, intercropping)?: _____

Q23a. If yes, how much did it increase (in bags/kg/bunches)?: _____

Q23b. If no, what do you think is the reason for that?: _____

Q24. How would you describe your level of participation in the FFLG?

- i) Low
- ii) Middle
- iii) High
- iv) I don't know

Q25. How often do you participate in FFLG activities and rotational visits during the farming season?

- i) 1 time per week
- ii) 2 times per week
- iii) 2 time per month
- iv) 1 time per month

Q26. Have you presented ideas for changes in the FFLG?

- i) Yes
- ii) No

Q26a. If yes, have they been implemented?

- i) Yes
- ii) No

Q27. Since joining the FFLG, have you experienced a higher success/income with your farm?

- i) Yes
- ii) No
- iii) I don't know

Q27a. If yes, how is this reflected (children in school, house improvement, increased food security)?: _____

Q28. Since joining the FFLG, have your social activities for your farm increased?

- iv) Yes
- v) No
- vi) I don't know

Q29. In your opinion, what is organic agriculture?

- i) Agriculture without chemical input
- ii) Agriculture without chemical input and with organic principles
- iii) I don't know

Q30. Who is working in your field?

- i) Myself only
- ii) Myself and family
- iii) Family
- iv) Employees
- v) Others: _____

Q31. Approximately how many working hours are being used in your field (state per day/week/month)?: _____

Q32. Since 2015 the working hours has:

- i) Increased, ii) Decreased, iii) The same, iv) I don't know

Q33. What are your expenses for your farm inputs (e.g. for seeds, fertilizers, tools etc.) per week/month/year?: _____

Q34. Which of these practices are you using?:

i) Organic manure/compost, ii) intercropping, iii) crop rotation, iv) mulching, v) record keeping, vi) farm planning

Q35. Can I visit you again if I have further questions?

- i) Yes
- ii) No

B. Interview guide: Semi-structured interviews with farmer household representatives**Name:****Date:**

Main question	Follow-up question(s)
Organic farming and FFLG	
1. Why did you want to be a farmer?	Did you farm before getting in the FFLG group? Was it organic or non-organic farming?
2. Why did you want to make organic farming?	If both organic and non-organic, why are you not 100% organic?
3. Do you think you will continue doing organic farming?	
4. Do you have any ideas what could make a higher yield on your farm?	
5. Do you have challenges for your farm?	If yes, which?
6. Do you wish to increase your yield?	If yes, how would you do that (intensify, expand farm, use more fertilizers organic or non-organic)?
7. How did you join the project?	Did you have friends or family who were members in any FFLG before you joined the project?
8. How has the FFLG project affected your household's life (income, social feeling, farm yield etc)?	How was your household's life situation before you joined the FFLG?
9. Since joining FFLG have you gotten more food for your household or less?	How?
10. Do you think your children will take over your farm?	If yes, with organic farming? If no, why not?
11. Do you make fallow periods for your farm?	If yes, do you do it on the entire farmland at once or shifting?
12. Do you think the project will continue to affect your life?	In which ways?
Human capital	
13. What is your education level?	What is your husband/wife's education level? What have you used your education for?
14. Are your children attending school? Which level?	If they finished school, at what level did they finish?
15. Where did you learn about farming?	How do you currently get the most information about farming?
16. How have you learned about organic farming?	How much did you learn from your FFLG facilitator? How do you currently get the most information about organic farming?
17. How would you describe your health?	How could your health become better?
18. How is the health in the household?	Anyone sick or has diseases? Has there been recently serious health problem in the household?
19. What did you learn from participating in training activities?	How do you find the level and frequency of training activities (too much or too little)?
20. Are you using traditional knowledge -	If yes, how so and why?

maybe you learned from your family or in the village - in your farming practices or are you only using the practices that you have learned from your facilitator?	
21. What have you learned from your facilitator about the goals of the project with the FFLGs?	
22. How many in your household are able to work (incl. yourself)?	
23. If you have nonfarm income, where did you learn the knowledge about the job?	
Natural capital	
24. How much land do you have?	Do you own, borrow or rent it?
25. Do you have access to enough water for your farm and for your household?	If not, why not? If yes, how did you get it?
26. Have the climate changes affected your yield?	If yes, how? Do you fear that it will affect it in the future?
27. Since becoming organic did you experience that your crops have stronger resilience to climate changes than when it was non-organic?	Have you seen an increased number of bees, insects, birds etc since becoming organic?
28. Have you experienced having pests and diseases in your crops?	What have you done to prevent it? Using organic or conventional methods?
29. Have you experiences failed harvest?	How did it affect your household's food security and economy?
30. Do you have savings?	If yes, how much? How do you keep them?
31. Do you have livestock?	If yes, how many?
32. Do you receive remittance?	If yes, how much and how often?
33. Is farming your household's main income source?	If not, what is your household's main income source?
34. Do your household has nonfarm income?	If yes , which (formal or informal) and how does it help your farm? How much does it contribute to your total income in %? Where is the job located (at home/on farm, countryside/rural area, nearby rural town, in the city or further away)? How does it affect your household's wellbeing? If not , why not and would you like to have it? How do you think it would change your farming possibilities and wellbeing?
35. How many household members are contributing with income?	
36. Do you experience that the prices for your crops have changed?	If yes, up or down? How does that affect your farm and income?
37. How are the season changes in your crops' market prices?	
38. Do you find the market prices for your crops unreliable or can you predict the changing prices throughout the year?	How does that make you feel? Do you worry?

39. Does your income vary significantly over the year e.g. due to seasons?	How does that affect your household's life?
40. At which time of the year do you need most cash (e.g for paying school fees etc)?	Is that the same time that you earn the most money? If no, how big of a problem is that for your household?
41. Do you own your own tools for your farm or do you borrow them?	
42. If using middleman, how sure are you to keep a good relationship?	Can you be sure to have your crops sold in the near or far future?
43. If you're selling at market, how sure are you that you can continue to do that in the near or far future?	
44. Does your FFLG have group loans to secure you in case of failed harvest?	If yes, how does it work? How much security does that give to your household?
Physical capital	
45. If using middleman, why couldn't you sell your products yourself?	Was transportation a problem?
46. How many rooms are in your house?	How many people live there? Do you have kitchen, toilet, good sanitation and energy in your house?
47. Can you transport your crops yourself?	If yes, how and what are the expenses?
48. Do you have access to transport (not for crops)?	E.g. motorcycle or bicycle?
Social capital	
49. How would you describe your social network?	
50. How are your relationships with the other farmers in your FFLG?	
51. Do you feel that you can contact other farmers to ask for help or talk about the farm?	If not, what do you think is the reason for that?
52. How do you find the participation level in your FFLG?	Do you think there should be more/less activities and visits?
53. Do you feel that your FFLG is open for everybody to participate and speak up?	Or is it a few people controlling? Why? What do you think about it?
54. Does people in your FFLG come up with new thoughts or ideas or is it mostly the facilitator who speaks?	Do you think there need change in that? Which?
55. If presented ideas, which ideas?	If they were not implemented, why not?
56. What happens in your FFLG when a member has an idea (who decides if it should be implemented or not)?	What do you think about that way?
57. Have you participated in forming the FFLG group plans?	If no, why not? Did all or most of the group members participate? If not, what do you think is the reason for that?
58. Do you find your FFLG independent or very dependent on UWAMWIMA when it comes to	

decision-making?	
59. Is there anything you think could improve your FFLG?	
60. Do you trust the other FFLG members?	
61. If the social activities in your farm have increased, please explain in which ways?	
62. Are there differences in rights to speak in the FFLG depending on if you are a man or a woman?	If no, how so? Do you think it should change?
63. How was your FFLG facilitator chosen?	
64. For how long have you lived in your village?	How do you like to live there?
65. If your harvest fails one season can you then get help (food and money) from friends or family?	If not, what will then happen?
66. Have there been conflicts within your FFLG?	If yes, about what? How was it handled?
67. How would you describe your possibilities to get help or guidance for your farm from your government?	
68. Have you gotten help with your farm from your government?	If yes, do you feel that they help you and that you can talk to them? How could it be better in the future? Do you want to do something active to change it? If didn't get help, why not?
69. Are you depending on others outside your household to make your farm work as it is now?	
70. Are you the one in your household who makes most decisions, or do you share the decision-making with your partner or is it only/mostly your partner who makes decisions?	
71. If you made joint marketing, how did that affect your social bonds?	And how did it affect your income from farming?
Personalized questions	
72.	
73.	
74.	
75.	

C. Interview summaries

C1. Bisambe Kombo Nasuha

Bisambe is a 24 year-old married woman, mother of 4 children and organic farmer. Lives on Pemba. FFLG called Nguvu Kazi. The interview was made on 15-03-2018.

Organic farming and FFLG: She started farming (non-organic) before getting member in FFLG. Reasons to farm is she had no other work to do. Reason for organic farming was to reduce chemical input – she gets more social life and more costumers because her harvest has no chemicals. She wants to expand her farm. Challenge is water. The FFLG helped her to make more income, social activities, friends and increased her yields and she now has more food for her family. She doesn't make fallow.

Human capital: She has an education level on form³⁸ 1 (uses it for reading and writing). Husband until standard³⁹ 7, one child is in standard 4 and one in standard 1. Learned about farming from parent, parent and later from UWAMWIMA. Learned a lot about organic farming from FFLG facilitator and training activities: planting crops and plantantion. Doesn't use ITK, only knowledge from project. Good health in whole household - due to the organic crops.

Natural capital: Household have 1 acre of land (borrowed). Not access to enough water – problem with the pump, so she walks far for water everyday. Climate change effect production: too many insects, strong sun, dry field due to lack of water and too much rain - a big concern, but organic more resilient. Sometimes 50% of the production gets destroyed by worms, but no failed harvest.

Financial capital: Saves 180.000 TZS per year, use it and make new savings and has 10 chickens. Farming main income, no non-farm income (because no time, but wish to make business later on so they can expand their farm). Income from her and her husband. Seasonality in prices – unreliable prices and sometimes no profit from surplus. Problem for household – can't make goals and plans and need money mostly for Ramadan and school year start. Kids gets sad when they don't have money to buy needed things for them. They sell through middleman and local open market. Very sure to keep having crops sold in the future. FFLG have group loans – big security.

Physical capital: Three room house, living seven people with only outside kitchen, no toilet, not good sanitation and no electricity. Rent a car when bringing crops to the marked. They have one bicycle.

Social capital: Good social network also in FFLG, good participation level in the FFLG, but thinks there should be more activities and visits in the FFLG. FFLG open for everybody to speak and people come with ideas. She gives the other members advices how to make a better farm. When a member has an ide they collectively decide if the group should implement it. All members participated in forming the FFLG group plans. Sometimes the FFLG is independent and sometimes it depends on UWAMWIMA. FFLG could improve if there were more activities in learning how to plant different crops. FFLG facilitator was chosen by the members. If harvest fail, the households can't get help from friends or family. No possibilities to get help or guidance for farm from the government. Share decision-making with husband. Makes joint marketing - more income, plans, friends and experience, useful for their farm.

Personalized questions

Q1: *How did your crop income increase so much from 2015-2017 (59.000 in 2015 to 2.220.000 in 2017)?*

A1: Because the crops are getting better everyday, I get more knowledge and I expanded my field.

Q2: *How did your method of selling your crops change from 2015 to 2017?*

A2: Before I didn't have access to transportation, so I couldn't get my crops to the market.

Q3: *Did you change your farming practices from 2015 to 2017? How?*

A3: Before, I was using chemicals and now only organic. Now I'm doing crop rotation and get more knowledge.

³⁸ Form 1 to 6 is the secondary school.

³⁹ Standard 1 to 7 is the primary school.

C2. Mpaji Abdallah

Mpaji is a 50 year-old married woman, head of household, mother of 3 children and organic farmer. Lives on Pemba. FFLG is called Vijana Kazi. The interview was made on 17-03-2018.

Organic farming and FFLG: She started farming (non-organic) before getting member in FFLG. Wanted organic because of no chemicals, which is good for environment and health and production. Plan to extend farm and make more organic manure and compost. Biggest challenge is animals, e.g. goats, eating the crops. She started the FFLG group with neighbours. FFLG helped with knowledge about agriculture, increased income and food and gave a good social life. Before FFLG life was harder. Makes fallow.

Human capital: Her education level is standard 7 (helped to read and write), one child is in form 2, one in standard 3 and one finished at form 2. Learned about farming from parents and organic farming from UWAMWIMA and lot from FFLG facilitator. Good health in household, but one daughter has been sick for seven years. The level of training activities is not so high but good frequency. Uses ITK from parents: digging and method for rain season.

Natural capital: Have 4 acres of land (borrowed). 2 acres have enough water from well and the other 2 acres don't, due to no water source in the hill. Climate change effect – too much sun, 2 acres with no water failed harvest (big problem for income, food insecurity for household). Big fear for future climate. Organic better resilience. Organic medicine to prevent pests and diseases in crops.

Financial capital: Household has a 230.000 TZS saving and one cow. 10-15.000 TZS remittance per month. Farming is main income, no non-farm income (can't get job, but would like to). It's only her who contributes with income. Prices for crops are unreliable – makes her nervous and problem not to predict income. She feels sure to be able to sell crops in the future. FFLG has group loans, which gives big security to the household.

Physical capital: House with three rooms for five people with no kitchen (but plan to build), no toilet, not good sanitation and no electricity. No access to transport.

Social capital: She has good relations, also to FFLG members. Good participation in FFLG, but it has to increase. When an idea is presented, they listen and all decide if it's a good suggestion that should be followed. All members participated in forming the FFLG group plans. The FFLG facilitator was chosen by the members. The household can get help from friends and family in case of failed harvest. They got help from the government: got a water pipe from the government in exchange for a vote for the party CCM. She is the one making the decisions in the household.

Personalized questions

Q1: *Has your participation level in your FFLG increased since 2015? If yes, why?*

A1: Yes, because now I get a bigger farm so more participation because more people help.

Q2: *What are the reasons for your high participation level in your FFLG?*

A2: Because of how we work and because we are many people and have many activities. Before we were only a few people.

Q3: *Has your high participation affected your farm? How?*

A3: Yes, because the other members come to help in my farm.

Q4: *How has your participation affected your social life?*

A4: It helps because when I'm not here, the other members can for instance look after my children and I don't have to worry about the safety of my children.

C3. Mariam Ferouz

Mariam is a 49 year-old woman, mother of 4 children and organic farmer. FFLG is called Uvumilivu. Lives on Unguja. The interview was made on 02-04-2018.

Organic farming and FFLG: She started farming (non-organic) before getting member in FFLG. Wanted to make organic to get more knowledge and better outputs. Will increase yield by using organic manure and make a better farm. FFLG did not change income or social life, but she got more food for the household. She makes fallow.

Human capital: Her and her husband's education level is form 3 - one child is in form 1 and one in form 3. Learned about organic farming from UWAMWIMA (to make compost, organic manure and how to follow the season). She has been sick for two years and can't work in the farm, but the health in the rest of the household is good. Medium level of training activities. She uses ITK from parents.

Natural capital: Household has 1 acre (borrowed) with enough water from well and public water pipe. Has failed harvest once per year for the last 5 years – effect the income and food security.

Financial capital: Household has no savings, but 15 chickens. Farming is the main income, no non-farm income (but would like to have). No income in the household. Market prices for crops are unreliable – makes her worried. Not enough money for Ramadan. She feels sure to keep selling her crops to the middleman. FFLG has group loans, which is a big security for the household.

Physical capital: She can't sell crops herself at the market due to no access to transport. House has five rooms for six people, with kitchen, toilet, no good sanitation and no electricity. They have one bicycle.

Social capital: Good social relations, but didn't see FFLG members for 2 years due to sickness. When an idea is presented, they listen and all decide if it's a good suggestion that should be followed. She has not participated in forming the group plans due to sickness. Says FFLG is very independent. The household can't borrow money from family and friend in case of failed harvest, but not so big problem due to the group loans. She feels she can get help from the government. Shared decision-making between husband and her.

Personalized questions:

Q1: *Has your participation increased or decreased since 2015? Why is that?*

A1: Decreased. Before I had high participation. Because I'm sick.

Q2: *What is the reason for your low participation in your FFLG?*

A2: I'm sick.

Q3: *Why didn't you present any ideas in your FFLG?*

A3: Because I'm not there.

Q4: *Do you wish you could participate more in your FFLG? How will you do that?*

A4: Yes. When I feel okay again I will go to the FFLG.

C4. Sharifa Saidi

Sharifa is a 67 year-old woman, mother of 3 children, head of household and organic farmer. FFLG is called Tushikamane Kina Mama. Lives on Unguja. The interview was made on 02-04-2018.

Organic farming and FFLG: She started farming (non-organic) before getting member in FFLG. Wanted to do farming because there were so many problems and poverty before. Wanted to make organic to get more knowledge about income, yield and record keeping. Will increase yield by expanding farm and use more organic fertilizer. Biggest challenges are thieves stealing crops and high prices on fertilizers and manure. FFLG helped for income, social relations and crops. Now she has a nice house with good roof, before only hut house with palm roof. She got a lot more food for household.

Human capital: Her education level is standard 7 - one child finished in form 2, one in form 3 and one in form 4. Learned about farming from parents and organic farming from UWAMWIMA and facilitator (to make farming and records). She has good health but is getting old which is a problem, as she can't manage to work like before. OK health in the household, but one daughter and one grandson are sick. She is satisfied with the training activities. She uses ITK from family.

Natural capital: Household has 0,5 acre (rented) with enough water from the public water pipe. Climate change effects farm, as she can't farm using the rain season anymore. Crops not resilient enough for climate changes – worries for the future. She has had many pests and diseases in crops – uses organic medicine to prevent it. Experienced failed harvest - hard for the household because it affects food security and income.

Financial capital: Household has a saving of 300.000 TZS in the bank and 9 chickens. Farming is the main income, no non-farm income (but would like to have). Her son and herself are contributing with income in the family. Market prices for crops are unreliable – makes her worried. But her income doesn't vary during the seasons, so she has enough money for Ramadan also due to the savings. She feels sure to keep selling her crops to the middleman. FFLG has group loans, which is a big security for the household.

Physical capital: House has five rooms for nine people, with kitchen, toilet, okay sanitation and with electricity. She transport her crops on the head. They have one bicycle.

Social capital: She has a very good social network and is the head of the community. Relations to other FFLG members are sometimes up and down. There is a big participation in the FFLG, but she wants to have more activities in the group. When an idea is presented, they listen and all decide if it's a good suggestion that should be followed. All members participating in forming the group plans. FFLG is very independent from UWAMWIMA. She is the facilitator and was chosen by the organisation that gave her facilitator education. She has tried to get help from the government – she got 700.000 TZS from the government to the FFLG. She is the only one making decisions in the household. She made joint marketing – helped social bonds and income.

Personalized questions:

Q1: *What are the reasons for your income decrease since 2015?*

A1: Because there was so much rain and then my income decreased because the rain destroyed my crops. Now I get another field where the rain can't destroy my crops.

Q2: *Why did you get lower yield since 2015?*

A2: Because the rain destroyed it.

Q3: *Did you change your agricultural practises since 2015? Which?*

A3: Yes, I made more organic since 2015.

Q4: *How can you get a higher yield and income?*

A4: I need more money to make a better farm and get more income. But I don't know how to get that money.

C5. Mohammad Iddy Mohammad

Mohammad is 63 year-old man, head of household, lives with his wife and two grandchildren and both organic and non-organic farmer. FFLG is called Mbele Daima. Lives on Unguja. The interview was made on 04-04-2018.

Organic farming and FFLG: He wanted to become a farmer to get out of poverty and farmed non-organic before joining the FFLG. Wanted to make organic to be able to see the different and he mixes with non-organic it's easier to farm and prepare. Will make higher yields by making a plantation for organic medicine for the farm, expand farm and use organic fertilizers. FFLG affected income, social feeling, food increase and a little bit on his yield.

Human capital: His education level is standard 7 (used for reading and writing), wife's is form 2. One child is in standard 1 and two finished form 4. He learned about farming from another FFLG the other members and gets most knowledge from his social participation. He is the facilitator. Good health in household. He is satisfied with the level and frequencies of training activities. He uses ITK from family – local fertilizers and mulching.

Natural capital: Household owns 3 acres of land, with not enough access to water. Climate changes affect the yield with too much sun and diseases, but organic crops have stronger resilience.

Financial capital: Household has a 200.000 TZS saving, 4 cows and 30 chickens. Farming is the main occupation, but they do also have non-farm income (informal milk production from cows, contributing to 50% of income). Two household members contribute with incomes. Crops' market prices are unreliable, which makes him worry. He has a season-based income, but it's not a problem because of his savings. He feels sure to keep selling his crops at the market. FFLG has group loans – gives more security to the household.

Physical capital: House has three rooms for four people, with kitchen, toilet, bad sanitation and no electricity. He transport crops with the local bus, daladala, and also has one bicycle and one motorbike.

Social capital: Very good social network, also good relations to FFLG members. The FFLG has good participation, but he wishes for more activities. All members present ideas and decide together if they should be implemented. The FFLG is independent. The facilitator (himself) was chosen by voting. He share the decision making in the household with his wife.

Personalized questions:

Q1: *How did you get increased yield without increased income since 2015?*

A1: I don't know why I my yield increased and my income decreased.

Q2: *Did you change your agricultural practices since 2015?*

A2: No.

Q3: *Why did your farm income decrease so much since 2015?*

A3: I don't know.

C6. Khamis Ramadhan Zam

Khamis is a 43 year-old man, living with his wife and one child and is an organic farmer. FFLG is called Kumekucha. Lives on Unguja. The interview was made on 04-04-2018.

Organic farming and FFLG: He farmed non-organic before joining the FFLG. He wanted to be organic because there are fewer expenses and it's good for the health and for the environment. He will increase the yield by fertilizing the land by making more organic manure. He was on the people forming the FFLG. The FFLG has helped a lot for social network, to reduce poverty, increase food (before FFLG only one meal per day, and now three meals per day), and get more help from the other members so it's easier to solve the problems. Before FFLG the household was poor because there was too much work they couldn't handle. But now they have a good social network and gets help from the other members.

Human capital: His education level is until form 3 (learned to read and write), wife until form 2, one child is in form 4, one in standard 6 and one in standard 1. He learned about farming from his family and about organic farming from e.g. UWAMWIMA. Household has a good health. Good training activities – learned how to take care of the land, how bad the chemicals are and how to protect the environment. He uses ITK from his family. Non-farm income from fish – he learned from his family.

Natural capital: Household own 1 acre and borrow 1 acre of land – they both have enough water due to a well. Climate changes don't affect the crops. He has had a fungus disease in his farm and tried one time to have a failed harvest (was a problem because he got more poor).

Financial capital: The household has a 500.000 TZS saving in the bank, 3 cows and 1 goat. Sometimes he also receives 100.000 TZS from his brother and 200.000 TZS from another brother one time per year. Farming is the main income, but informal fishing contributes to 30% of the income and it's good for household expenses and food security. Two household members contribute with incomes. The crops' marked prices are predictable which is good for him, but his incomes are still based on seasons, which is not good and he can't reach his goals. But because of savings, money is not a problem for school fees etc. He plans to open a small market in his village and to also sell to hotels. The FFLG has group loans, which is a big relief for him.

Physical capital: House with two rooms for three people, with kitchen, toilet, okay sanitation and solar power for electricity. He transports the crops by car or local bus. Household has one bicycle.

Social capital: He has a good social network and good relations to other members in FFLG. There is a good participation in the FFLG, but there should be more activities. The members decide if an idea should be implemented. All members participated in forming the FFLG group plans. The FFLG is independent. They have a close relation to a nearby FFLG and make rotational visits to learn from and help each other. The facilitator was chosen by voting. If their harvest fails, the household can get help from friend and family. He got help from the government – a loan of 3.000.000 TZS for the FFLG. He is depending on the other members' help on his farm. In the household the wife and him share the decision-making. The household makes joint marketing, which make better social bonds, lowers expenses and is time saving.

Personalized questions:

Q1: *Has your participation increased since 2015?*

A1: Yes, it increased a lot. Now I know how to participate well and how to solve the problems.

Q2: *What do you think are the reasons for your big participation in your FFLG?*

A2: Because I'm the facilitator.

Q3: *Has your high participation affected your farm? How?*

A3: Yes - there is a politician who saw my farm and he then bought a water tank and tower for my farm.

Q4: *How has the participation affected your social life?*

A4: It affected so much my social life. In my street there was a thief who stole the bananas and then we got a new chief for protecting. Now we can help each other to protect our farms.

D. Chi-squared tests: Sample's representativity of population

<p>Calculation methods:</p> <p><i>Sample observations</i> A simple count of the number of observations for each category.</p> <p><i>Population frequency</i> A simple count of the number of observations in the population divided with the population size of 310 for each category.</p> <p><i>Expected</i> The total sample size of 44 multiplied with the population frequency.</p> <p><i>P-value</i> The calculation of the <i>p</i>-value is based on the values of the <i>Sample observations</i> and <i>Expected</i> by using the Excel formular 'chi2.TEST'. All of the null-hypotheses are accepted on a 5% significance level (0,05)</p>
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Hypotheses - Income groups:

H_0 = The observed distribution of income groups in the sample follows the distribution in the population

H_A = The observed distribution of income groups in the sample does not follow the distribution in the population

Income groups	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
0-999.999	27	0,58	25,69	0,326
1.000.000-3.499.999	10	0,31	13,77	
3.500.000 and above	7	0,11	4,68	
Total sample size	44			

Hypotheses - Sex of the respondent:

H_0 = The observed distribution of sex of the respondent in the sample follows the distribution in the population

H_A = The observed distribution of sex of the respondent in the sample does not follow the distribution in the population

Sex of the respondent	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Male	18	0,44	19,36	0,680
Female	26	0,56	24,64	
Total sample size	44			

Hypotheses - Age groups:

H_0 = The observed distribution of age groups in the sample follows the distribution in the population

H_A = The observed distribution of age groups in the sample does not follow the distribution in the population

Age groups	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
18-35	15	0,24	10,65	0,317
36-53	24	0,56	24,84	
54-71	5	0,18	7,81	
72 and above	0	0,02	0,71	
Total sample size	44			

Hypotheses - Sex of the head of household:

H_0 = The observed distribution of the sex of the head of household in the sample follows the distribution in the population

H_A = The observed distribution of the sex of the head of household in the sample does not follow the distribution in the population

Sex of the head of household	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Male	26	0,45	19,73	0,057
Female	18	0,55	24,27	
Total sample size	44			

Hypotheses - Household size groups:

H_0 = The observed distribution of household size groups in the sample follows the distribution in the population

H_A = The observed distribution of household size groups in the sample does not follow the distribution in the population

Household size groups	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
1-5	20	0,44	19,16	0,967
6-10	22	0,52	22,71	
11 and above	2	0,05	2,13	
Total sample size	44			

Hypotheses – Districts:

H_0 = The observed distribution of districts in the sample follows the distribution in the population

H_A = The observed distribution of districts in the sample does not follow the distribution in the population

Districts	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Chake	2	0,03	1,42	0,968
Kaskazini A	8	0,15	6,81	
Kaskazini B	5	0,12	5,39	
Kati	6	0,23	10,08	
Kusini	4	0,09	4,12	
Magharibi A	2	0,03	1,28	
Magharibi B	1	0,03	1,28	
Micheweni	2	0,03	1,28	
Mjini Magharibi	1	0,02	0,99	
Mkoani	7	0,12	5,39	
Wete	6	0,14	5,96	
Total sample size	44			

Hypotheses – Islands:

H_0 = The observed distribution of islands in the sample follows the distribution in the population

H_A = The observed distribution of islands in the sample does not follow the distribution in the population

Islands	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Unguja	27	0,68	29,95	0,340
Pemba	17	0,32	14,05	
Total sample size	44			

Hypotheses – Occupations:

H_0 = The observed distribution of income groups in the sample follows the distribution in the population

H_A = The observed distribution of income groups in the sample does not follow the distribution in the population

Occupations	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Crop farming	43	0,97	42,72	0,584
Livestock	11	0,18	7,95	
Employment	11	0,25	11,07	
Business	8	0,26	11,50	
Other	6	0,19	8,23	
Total sample size	44			

Hypotheses - Farming practices:

H_0 = The observed distribution of farming practices in the sample follows the distribution in the population

H_A = The observed distribution of farming practices in the sample does not follow the distribution in the population

Farming practices	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Organic	25	0,62	27,39	0,132
Non-organic	3	0,07	3,12	
Both	15	0,30	13,34	
No response	1	0,00	0,14	
Total sample size	44			

Hypotheses - Farm size groups

H_0 = The observed distribution of farm size groups in the sample follows the distribution in the population

H_A = The observed distribution of farm size groups in the sample does not follow the distribution in the population

Farm size groups (acres)	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
0-0,9	6	0,22	9,79	0,724
1-1,9	16	0,34	14,90	
2-2,9	11	0,24	10,36	
3-3,9	5	0,09	4,12	
4 and above	6	0,11	4,83	
Total sample size	44			

Hypotheses - Organic crops cultivated:

H_0 = The observed distribution of organic crops cultivated in the sample follows the distribution in the population

H_A = The observed distribution of organic crops cultivated in the sample does not follow the distribution in the population

Organic crops cultivated	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Green vegetable	19	0,50	22,00	0,915
Tomato	15	0,35	15,47	
Okra	9	0,24	10,65	
Eggplant	13	0,33	14,62	
African eggplant	5	0,07	3,26	
Cassava	28	0,66	28,95	

Banana	22	0,56	24,70	
Rice	11	0,26	11,64	
Cucumber	4	0,11	4,68	
Green pepper	9	0,15	6,67	
Watermelon	4	0,04	1,85	
Yams	7	0,18	8,09	
Maize	6	0,09	3,97	
Onion	2	0,05	1,99	
Total sample size	44			

Hypotheses - Non-organic crops cultivated:

H_0 = The observed distribution of non-organic crops cultivated in the sample follows the distribution in the population

H_A = The observed distribution of non-organic crops cultivated in the sample does not follow the distribution in the population

Non-organic crops cultivated	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Green vegetable	1	0,11	4,83	0,613
Tomato	8	0,16	7,10	
Okra	5	0,10	4,26	
Eggplant	4	0,09	3,97	
African eggplant	1	0,06	2,70	
Rice	7	0,11	4,97	
Green pepper	3	0,08	3,69	
Watermelon	5	0,10	4,40	
Total sample size	44			

Hypotheses - Marketing methods:

H_0 = The observed distribution of marketing methods in the sample follows the distribution in the population

H_A = The observed distribution of marketing methods in the sample does not follow the distribution in the population

Marketing methods	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Local open market	15	0,39	17,32	0,335
Middleman	16	0,30	13,06	
AMCOS	1	0,01	0,28	
Other	11	0,23	10,08	
No response	1	0,08	3,41	
Total sample size	44			

Hypotheses - Joint marketing:

H_0 = The observed distribution of joint marketing in the sample follows the distribution in the population

H_A = The observed distribution of joint marketing in the sample does not follow the distribution in the population

Joint marketing	Sample observations (n=44)	Population frequency (N=310)	Expected	P-value
Yes	6	0,11	4,68	0,352
No	37	0,82	36,19	
No response	1	0,08	3,41	
Total sample size	44			

E. Percentage increase/decrease of total household income from 2015 to 2017.

Number	LIG	MIG	HIG
1	8,307	298	-12
2	1,968	233	-95
3	0	11	-15
4	N/A	180	-30
5	261	17	-74
6	391	-21	-44
7	1,665	266	-81
8	251	8	
9	6,150	167	
10	-100	76	
11	3,233		
12	140		
13	157		
14	366		
15	450		
16	-40		
17	289		
18	1,420		
19	371		
20	N/A		
21	-100		
22	959		
23	86		
24	596		
25	1,337		
26	209		
27	357		

Green = increase

Red = decrease

Yellow = no difference

N/A = there was no income in one of the two years and a calculation could therefore not be made