



MOZAMBIQUE: peasant farmers adaptation to climate change

Authors: Boaventura Monjane, David Escudero King and Julie Fogt Rasmussen

Edited by: La Via Campesina Southern and Eastern Africa and AfrikaKontakt

Introduction and overview

About 70% of Mozambique's population of roughly 24.5 million people live in rural areas (UN.org, 2015) and rely on the agricultural sector for their livelihoods (World Bank 2016c). The civil war (1977–1985) had severe consequences for Mozambique's economy and agricultural productivity (World Bank 2016a). The country remains one of the poorest in the world and the current regional drought is increasing malnutrition and food insecurity levels. According to the report by FAO entitled State of Food Insecurity in the World (2015), Mozambique had tried to achieve the Millennium Goal Number one (MDG1) hunger target of halving undernourished population by 2015¹. Yet, chronic under nutrition, poverty and households' vulnerability to food and nutrition insecurity due to natural disasters and other emergencies are some of the underlying challenges.

More than half of the population live below the poverty line and poverty rates are hardly improving. Poverty is concentrated in the rural areas and in the central and northern regions, and those figures further mask significant regional disparities. For instance, the provinces Zambezia and Nampula saw poverty rates actually increase by 5% in the period 2003-2009, and in 2008 accounted for almost half of the poor (48%) (World Bank, 2017). This further results in very high levels of food insecurity. Nearly half of all children under the age of five are malnourished - a rate that has remained largely unchanged since 2003 - and chronic under-nutrition accounts for at least a third of child deaths (World Bank, 2012).

The agriculture sector has a key weight in the economy of the country, contributing 22.6% of the GDP in 2013 (Banco de Moçambique, 2014) and 20% of total exports (Vunjanhe and Adriano, 2015). Between 2003 and 2008, it

¹ FAO.2015. The state of food insecurity in the world (2015).

averaged a significant growth of 7.9% annually. Mozambique has been ranked third among African countries most exposed to risks from climate-related disasters (Climate Investment Funds, 2012). With most Mozambicans (60%) living along the low-lying coast, facing chronic poverty, inadequate health services, and heavy reliance on rain-fed subsistence agriculture, any changes to the nation's ecosystems have an immediate impact on its population.

This research looks at how small-scale and family farmers, the most affected by climate change in the countryside, respond to the effects of climate change in Mozambique. The field study was conducted in Manica province - central Mozambique - where farmers are increasing political consciousness on sustainable farming and agroecology as a way of combating climate change, even in a context in which dominant discourses (from government and NGOs) promote the commodification of agriculture, namely the use of hybrid seeds and fertilizers.

Agriculture

The country's farming sector is composed in its vast majority by peasant farmers - they represent more than 98% of the total number of farmers; the majority of whom are women (89%) (World Bank, 2012). According to the last agricultural census, Mozambique's 3.2 million small-scale farmers occupy about 95% of the cultivated land (Censo Agro-Pecuário (2009-2010), published in Nov 2011). Small-scale farmers cultivate plots of 1.2 ha, on average, which are often subdivided into smaller plots. Mozambique does not produce enough maize to feed its population and relies increasingly on imports thus there is need for crop diversification to improve on food security and nutrition. Agriculture which is considered as the largest sector of Mozambique's economy has great influence on the

people's lives in the country. Approximately 80 percent of households are involved in the sector².

Forests comprise about 40% of Mozambique's land cover, with miombo and mopane forest the country's most extensive forest types. It is estimated that the forestry sector supplies 80% of the country's energy, and sustains the livelihoods of about 11.9 million people (USAID, 2012).

In 2007, preceded by the launch of the Alliance for Green Revolution in Africa (AGRA), and in response to the dramatic food price increase of 2007-2008 triggered by the global financial crisis, Mozambique developed the Green Revolution Strategy. The Strategy aimed at improving productivity by increasing production areas, utilising so-called improved commercial seeds and chemical fertilisers, and investing in irrigation and mechanisation. In terms of crops, the document defined as priorities the production of cereals (maize, rice, sorghum and wheat), legumes (beans, peanuts and soya), roots and tubers (cassava and potatoes), and vegetables in green areas of urban centres.

The Mozambican green revolution was soon associated with a wave of agribusiness, including the promotion of biofuels, particularly jatropha. However, it is worth highlighting that only 15 percent of small-scale farmers in Mozambique purchase certified seed; the vast majority depend on seeds saved from crop to crop or exchanged with neighbors³. When climate change calls, farmers can lose their seeds as they lose their crops, and they scarcely have resources to purchase replacements. UNAC advocates for protection of farmers from losing their seeds and their seed bank can prevent climate change from becoming a climate disaster.

² Ibid; FAO, 2015

³ Ibid; TWN, 2017

The current overarching agricultural strategy is the Strategic Plan for Agricultural Development (PEDSA, 2011-2020), Mozambique's latest instrument for the implementation of the Green Revolution, which is aligned with the country's regional and international commitments, in particular the Comprehensive Africa Agriculture Development Plan (CAADP). The PEDSA focuses on strategic farming areas identified as having the greatest potential for economic development, and targets key resources to these areas. It advocates for an average increase in agriculture of 7% per year. The focus remains mainly on value chain and agro-industrial approach rather than addressing the structural issues which keep family farmers into poverty (Vunjanhe and Adriano, 2015). Similarly, it is worth noted that, whilst the PEDSA recognises the critically important role of women in agriculture, it does not take a substantive approach with regard to the persistent gender inequalities in social and economic life.

The implementation of the Strategy is governed by the National Agricultural Investment Plan (PNISA, 2013-2017), which favours the growth of agribusiness in the country through the creation of large export corridors under major investment from the New Alliance for Food Security and Nutrition. Contrary to a diversifying view of productive systems, the PNISA clearly focuses on the prioritisation of specific crops. It divides them into food crops - maize, rice, wheat, beans, cassava, tomatoes, potatoes, and sweet potatoes - and yield crops - cashew, cotton, tobacco, sesame, which are all traditional, and soya. The financial resources under the PNISA are disproportionately allocated to yield crops in comparison to food crops and their weight in the national diet (Vunjanhe and Adriano, 2015).

Climate Change

The country has a tropical to subtropical climate, with some semi-arid regions in the southwest of the country. The east consists of

lowlands while the west is more mountainous. Average temperatures are highest along the coast as well as in the south of the country (20-26°C) and lower in high inland regions. There are seasonal temperature variations, with a cool dry season from April to September (coolest months are June – August) and a hot humid season from October to March (warmest months are December – February).

Annual temperature has increased by 0.6C degrees from 1960 to 2006. The increase was observed in all months except September – November. The central region of the country saw increases of up to 1.6C and an increase of 1.1C was recorded in the north (INGC, 2009). Annual temperatures are projected to increase by between 1.0 to 2.8C degrees by the 2060s (McSweeney et al, 2010). Generally, projections suggest that the climate may become more extreme, with hotter drought spells and more extreme floods. The central zone is likely to be hardest hit, especially at low altitudes (INGC, 2009).

Rainfall is highest in the north (1,000 mm/year) and lowest in the southeast (500 mm/year), but also varies according to topographic features – with most rainfall in higher areas and along the coast. The driest area of the country is the southern inland area, where some locations receive only 300 mm of rainfall per year (GERICS, 2013). Rainfall mainly occurs during the hot season, from November to April – with the majority falling between December and February. Mozambique is frequently affected by tropical cyclones which mainly occur during the hot, humid season. Average annual rainfall has decreased at a rate of 2.5mm per month between 1960 and 2006 (McSweeney et al, 2010). Despite this decrease, the proportion of rainfall falling in heavy events has increased significantly with the largest increases in the wet season of December to February (IPCC, 2014). There are also indications of a later start to the rainfall season and an increase in the length of drier spells (INGC, 2009).

25% of all cultivated land is located in low-lying areas. Therefore food production, particularly around river basins and coastal zones, is vulnerable to flooding and intense rainfall, which erodes land surfaces. Flooding, heavy rains, and droughts can contribute to losses in crop yields which may exacerbate the high chronic malnutrition level in Mozambique. Sea level rise also poses a threat to food production as it can lead to saline intrusion of agricultural lands along the coast (USAID, 2012).

The impacts of climate change in Mozambique are likely to stall the country's development, pose a serious risk to food security, nutrition and adaptive capacity. Issues to do with uncertainties in rainfall patterns characterized by low rainfall patterns and droughts affecting crop productivity, killing livestock due to lack of drinking water and grazing land and also affecting peoples livelihoods who depend on agriculture for survival, employment and income as well as their food sovereignty and nutrition status. Other adverse effects include violent storms and floods resulting in the destruction of people's shelters, livestock kraals, schools, hospitals but above all fields are swept away with rivers and dams as well roads and bridges being washed away.

SHFs and their families are particularly vulnerable because they have few assets to fall back on and limited ability to recover from climate extremes. Increasing the resilience of SHFs especially women is therefore a matter of urgency. Climate change undermines poverty reduction and development gains as well as threatening food security and sovereignty and women's livelihoods. In this regard there is need for mainstreaming of climate adaptation throughout national and regional development projects targeting agriculture⁴.

Despite all these effects, small holder farmers (SHFs) have devised their own ways of being

climate change resilient that include producing drought tolerant crops such as small grains that include sorghum, millet, ground nuts, cow peas, sesame and round nuts as well as cassava. The farmers have also shifted to small livestock such as goats, sheep, pigs, 'village chickens', guinea fowls, In times of erratic rainfall patterns, SHFs have also now practicing sustainable water management such as water harvesting such that involve digging earth dams and pit holes to capture the scarce water. During heavy rains seasons the SHFs have also begun digging bigger dams, contours so that rains do not destroy the fields; agro-forestry that involve fruit tree planting (both wild and exotic trees) and constructing rock walls around their homes to ensure that their homes are protected against violent storms and to hold intact soil that it won't be swept away by the heavy rains.

In a study by International Fund for Agriculture (IFAD) entitled Small farms, big impacts: mainstreaming climate change for resilience and food security; it highlighted that Climate change threatens the natural resource base across much of the developing world. Climate change accelerates ecosystem degradation and makes agriculture more risky. As a result, SHFs, who are so crucial to global food sovereignty and 'security' including nutrition, are facing more extreme weather. SHFs and peasant farmers especially women and youth are impacted more immediately by droughts, floods and storms, at the same time as they suffer the gradual effects of climate change, such as water stress in crops and livestock, coastal erosion from rising sea levels and unpredictable pest infestations.

The research further found out that despite all these effects, small holder farmers (SHFs) have devised their own ways of being climate change resilient that include producing drought tolerant crops such as small grains that include sorghum, millet, ground nuts,

⁴ Olushola Fadairo; Climate change projects aren't working because communities are left out; Thursday 20 April 2017.

cow peas, sesame and round nuts as well as cassava. The farmers have also shifted to small livestock such as goats, sheep, pigs, 'village chickens', guinea fowls. In times of erratic rainfall patterns, SHFs have also now practicing sustainable water management such as water harvesting such that involve digging earth dams and pit holes to capture the scarce water.

National strategy and policy framework

Mozambique national government and other, regional including Zimbabwe, continental and international governments and policy-making bodies have also grappled with climate change issues with various policies and programmes being implemented to adapt and cope with harsh weather patterns ranging from droughts, floods, ground frosts all affecting crop and livestock production as well as peoples livelihoods. The governments continue to push for policies that promote conventional forms of agriculture that have failed to address climate change issues.

The Government of Mozambique is making strides to enhance its climate change response framework and develop the National Climate Change Strategy (NCCS) with the help of the Inter-Institutional Group on Climate Change. In June 2011, the then Ministry for Coordination of Environment Affairs (MICOA), now MITADER, was developing a national climate change strategy. MICOA signed a Memorandum of Understanding with One-World Sustainable Investments to support the Government of Mozambique on climate change and development responses.

This is among the policies and programmes that seek to establish specific provisions for dealing with climate changes issues, under-

standing the extent of the threat and putting in place specific actions to manage potential impacts. Reports of the Inter-governmental Panel on Climate Change (IPCC) state that Africa will suffer the most from the impacts of climate change. The strategy further provides guidance on the integration of climate change issues into national development planning processes at national, provincial, district and local levels and ensures coordinated activities.

In Mozambique, the issue of climate change in relation to food security and nutrition started with the National Green Revolution, Agricultural Development Policy Operation Plan 2, Action Plan for Food Production, Strategic Plan for the Development of the Agricultural Sector (2011-2020)- Aligned to the CAADP, Five Year Government Plan (2014-2019) and the National Investment Plan for the Agricultural Sector (2011-2020)⁵. The Government of Mozambique declared eradicating poverty as a priority for economic development, where action plans for this purpose are designed and implemented among line of ministries and special units.

Mozambique is part of the regional grouping the Southern Africa Development Community and also of the United Nations Convention on Climate Change. This determines any Mozambique's climate change response strategies. Mozambique's Strategic Plan for Agricultural Development, known as PEDSA 2010–2019, outlines priority actions to increase fertiliser use in the country and has developed a fertiliser strategy and launched a fertiliser platform. Mozambique signed the CAADP Compact in 2011. Spending on the agricultural sector averaged about 5% of the national budget for 2003–2013 and the sector has grown by more than 6% per year since 2005. Mozambique's Agenda 2025 adopted in 2003 represents the long term development vision of the country.

⁵ FAO; Country Fact Sheet On Food And Agriculture Policy Trends- Food and Agriculture Policy Decision Analysis Socio-economic context and role of agriculture; July 2016.

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Mozambique ratified the Framework Convention on Climate Change (UNFCCC) in August 1995, the Kyoto Protocol in 2005, and was among the first States to sign and ratify the Paris Agreement in April 2016. Mozambique also ratified UN conventions on Ozone Layer Protection and on Wetlands.

As a Least Developed Country (LDC) in the UNFCCC, Mozambique published a National Adaptation Programme of Action (NAPA) in 2007, identifying the most vulnerable areas to climate change, and proposing immediate actions to promote adaptation to these urgent issues. Sectoral priorities identified are agriculture, fisheries, energy, environment, water, and coastal zones. The Programme also highlights the need to improve early warning and risk reduction measures, expand climate hazard monitoring, improve inter-agency coordination, promote the

mainstreaming of climate change adaptation into development plans and district-level planning, and foster climate change-related knowledge and skills at the local level (Adaptation Partnership, 2012; USAID, 2012).

In 2012, the Mozambique Government published its National Climate Change Strategy (2013-2025). This strategy widened the government's approach to climate change in proposing actions that combine measures of adaptation and mitigation with the development of a low-carbon economy. The overall objective aims to: "establish guidelines for action to build resilience, including the reduction of climate risks for the communities and the national economy and promote the development of low carbon and green economy, through their integration in the sectorial and local planning processes". The specific objectives are to:

- (i) become resilient to the impacts of climate change in Mozambique, while minimising climate risks to people and property, restoring and ensuring the rational use and protection of the natural and built capital;
- (ii) identify and implement opportunities to reduce Green House Gas (GHG) emissions that contribute to: sustainable use of natural resources, access to financial resources and technological affordable resources; and the reduction of pollution and environmental degradation by promoting low-carbon development; and
- (iii) build the institutional and human capacity as well as exploring opportunities to access technology and financial resources to implement the national climate change strategy.

The strategy provides a policy framework for climate priorities identified at sector, provincial and district levels (Irish Aid, 2016).

⁶ PROJECT: Supporting the Mozambique Climate Change and Development country programme.

The Government also adopted in 2012 the National Climate Change Adaptation and Mitigation Strategy (NCCAMS) covering the period 2013-2025, which identifies adaptation and the reduction of the climate risk as a national priority and presents eight strategic actions aimed at creating resilience and reducing the climate risk in the communities, ecosystems and national economy. The eight strategic actions are aimed at; reducing climate risk, water resources, agriculture, fisheries and food security and nutrition (SAN), social protection, health, biodiversity, forests and infrastructure (Irish Aid, 2016). The Strategy was prepared by the Inter Institutional Group on Climate Change (GIIMC), representing a number of sectoral ministries, the private sector and civil society, under the coordination of the Ministry for the Coordination of the Environmental Affairs (MICOA), with the consultations of other Ministries such as the Ministry of Agriculture (MINAG), as well as Provincial Governments (NCCAMS, 2012).

As one of the most African countries affected by climate change, the country has strongly put the priority on adaptation – instead of mitigation – in its climate change policies and strategies. Since 2000, Mozambique's concerns on climate change have increased. Successive floods have led to government resettlement programmes, mainly in the Limpopo and Zambezi valleys (MER, 2015), which encourage farmers living in resettlement villages to access new land in high zones for use during the wet season. However there is little data available on the numbers moved or socio-economic impact, despite the scale of the resettlement programmes (MER, 2015).

The government developed the Mozambique's environment fund, as a National Implementing Entity (NIE) under the Adaptation Fund of the United Nations Framework Convention on Climate Change (UNFCCC). Attaining NIE accreditation opens access to adaptation project finance. It serves as a first step toward the project development and management

capacity required to meet the strict fiduciary standards for Mozambique to access broader climate finance opportunities. This assistance formed part of the joint UNDP/UNEP NIE Support Programme and built on an initial assessment by the UNDP/UNEP team of the main areas where policies, procedures and systems need to be put in place to meet the criteria of the Adaptation Fund. The fund has not adequately been funded thus it still remains to meet its set out objectives.

From the above, it can be noted that the Mozambique government has not yet also come up with a climate change policy just like its Zimbabwean counterpart. It can also be noted that any climate change policy is also funded and developed in line with global perspectives and not emanating from local SHFs climate change resilience and adaptation practices.

The governments continue to push for policies that promote conventional forms of agriculture that have failed to address climate change issues. The government and other policy making bodies have been promoting Climate Smart Agriculture (CSA) and climate change adaptation programmes that have failed to deal with climate change threats.

Focus on climate smart agriculture and lack of coordination

Focus on CSA and chemical fertiliser

The UN Food and Agriculture Organisation state that Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or

removing greenhouse gas emissions, where possible.

The government of Mozambique has failed to recognize the important alternative climate change resilient practices SHFs and peasant farmers have adopted. These practices range from agroecology, food sovereignty, crop diversification, crop rotation, agro-forestry, conservation agriculture and water harvesting practices including sustainable water and soil management practices. The government and other policy institutions have also failed to recognize the importance of indigenous seeds and the production of small grains (Pulses) as another way of climate change resilient practices.

The government and other research bodies keep on pressurizing SSFs and peasant farmers to utilize hybrid seeds especially maize. Continued usage of synthetic fertilizers result the in the soil nutrients and organisms that improve soil fertility being destroyed.

There has been capacity building and awareness raising of the Disaster Risk Reduction strategy and this work provided an actionable, concise strategy document on Mozambique's response to climate change in order to raise awareness amongst key stakeholders. These policies have been described as 'false path ways' by SSFs and peasant farmers who claim that these policies do not adequately address issues to do with climate change threats, issues of land grabbing, usage of hybrid seeds but are there just to support and promote corporate and conventional forms of agriculture by commercial farmers and MNCs at the expense of SSFs' initiatives on agro-ecology and food sovereignty and indigenous seed multiplication.

The programmes are mostly about responding instead of promoting resilience.

Lack of coordination and cooperation at government level

Integration of climate awareness and targeted actions across the various line ministries is critical for the success of climate change strategies. So far, responsibilities on climate change had been distributed among various ministries, and a lack of coordination and cooperation between the various governmental actors had been mentioned by a number of sources as the major weakness of Mozambique's attempts to combat climate change effects (MER, 2015). In order to improve this coordination, a Climate Change Coordination Unit (Unidade das Mudancas Climaticas, UMC) became operational in 2014, with support from the World Bank's Climate Change Technical Assistance project (CCTAP). This UMC is intended to function as a cross-governmental body for coordination of climate change activities. It has started to develop a national monitoring and evaluation system for the National Climate Change Strategy, which will enable reporting to the Climate Investment Fund and to Mozambique's Council of Ministers (Climate Investment Funds, 2012). It has also started developing a climate knowledge management hub hosted by a Mozambican University (UEM) (World Bank, 2014). Considering the number of adaptation projects implemented in the country, this could be crucial to ensure that good practices are shared and coordinated as appropriate in order to minimize overlap and maximise lessons learnt.

Findings

Research area

The fieldwork discussed in this paper was carried out in Manica province, Mozambique, in May of 2017, and was done in collaboration with União Provincial de Camponeses de Manica (UCAMA), as well as with staff members of União Nacional de Camponeses (UNAC).

UNAC is the largest social movement in Mozambique. According to estimates by its last General Electoral Assembly in 2016, the movement has more than 120,000 members and is the largest and most organised agrarian movement in Southern Africa (Monjane, 2018 – unpublished). It was born in the context of cooperativism and was transformed, with the structural changes that affected the politics and the economy in Mozambique, in a movement not only of cooperatives, but of peasants. The movement has members in all provinces of the country.

Manica is one of Mozambique's provinces, a narrow strip on the western side of the country. Manica Province and its coastal adjacent Sofala Province are of great strategic and historical importance to Mozambique. They are connected by the Beira corridor between Mutare in Zimbabwe and the port of Beira on the Indian Ocean, which was important to the Swahili gold trade in medieval times and continues to be important to modern trade. The province is an important producer of a wide range of fruits and vegetables. Chimoio, the capital city of Manica Province, is an important commercial centre for the trade of agricultural products which comes in from the surrounding fertile areas⁷.

The results detailed below were obtained through a series of semi structured interviews, as well as topic focused interviews with a total of 9 farmers, members of UCAMA, over a period of four days. UCAMA is the Manica farmer's organisation which is part of UNAC. In 2000, UNAC affirmed itself as a peasant movement, which included a vision to end inequality and change society through solidarity. By about 2008, climate change issues started taking more of a focus in UNAC. One staff member commented on this: *"we could already feel the impact before, but we didn't really understand it."* The term "agroecology" started being used by members in UNAC due to the

organisation's membership in La Via Campesina (since 2003). Whilst UNAC advocates this political approach to agriculture, we will see that it has yet to filter down to UCAMA, who have more of a focus on "conservation agriculture", a depoliticised approach to climate change adaptation. Similarly, the concept of "food sovereignty" is also pushed by UNAC, but as the staff member told us, the farmers on the ground hear more about "food security" (again, the depoliticised analogue to food sovereignty) because that is what is most used and repeated by the state.

All interviewees cited experiencing an increasing unpredictability of weather patterns, specifically the arrival of the rains. All said that they experienced long periods of drought, with one even referring to climate change in general simply as "too much sun." Few of the farmers interviewed used the term climate change or were able to conceptualize it, and instead referred to it by its effects. A potential issue with this is that it could lead to an understanding of these effects that is depoliticised, that doesn't take into account human agency, or the different actors that are involved. Indeed, one farmer interviewed thought that it was God changing the weather. What this indicates is the importance of understanding concepts as well as their political dimensions. If the political problem of climate change is understood in a depoliticised way, then the approaches to climate change adaptation imagined will only be depoliticised, when they should involve an understanding about and a mobilization around political and emancipatory approaches. Understanding political origins and the need for a political response could help farmers identify false solutions, or farming practices that will increase their vulnerability, even (especially) if these practices are pushed by figures of authority, such as the government.

⁷ <https://www.mozambiqueinformation.com/provinces-of-mozambique.html>

Adaptation

Although the water conservation techniques of these farmers that are discussed below can generally be thought of as “adaptation” there is overlap with the implementation of what are deemed simply better farming practices that are disseminated through UCAMA. It is difficult to distinguish between these two, partly due to the limited understanding of climate change that was found, such that adaptation to climate change is less of an obvious rationale. One example is when it comes to using manure instead of chemical fertilizers, which conserves moisture, and is a practice that was increasingly implemented due to the influence of UCAMA. Despite this, some of the farmers interviewed still used chemical fertilizers. For example, one farmer told us that they buy fertilizers as well as pesticides to keep the worms away, all the while recognizing that UCAMA says it will destroy the soil. Another farmer said: *“We don’t use fertilizers anymore, it is a process that we learn.”*

Water conservation however, can be said to be adaptation in as much as it directly deals with an experienced effect of climate change (unpredictability of rains). Several farmers told us that they planted closer to nearby rivers, because the soil had more moisture: *“Now that we can’t predict the rains, we use the land near the river every year.”* The issue with this is that, as adaptation, it addresses potential droughts at the expense of the crops becoming more vulnerable to flooding if rains are more intense than expected. This change in planting habit had the purpose of assuring a certain amount of food as a safety net, with one farmer telling us: *“The river plots are enough to sustain food security, the rest is sold if there is a good year.”* Water conservation being a main point of concern, many farmers expressed a desire for funding for water pumps, so that they could bring up the water from the river more easily rather than bringing it

to the fields in buckets. The desire for funding for new technologies to increase yields was recurrently raised. All of the farmers interviewed told us that they no longer burn grasses on their fields because it helps to conserve moisture. *“When we burn the grass, the cob is smaller and yellowish. Grass keeps moisture for longer, we can deal with the lack of rain much better.”* Mulching is also increasingly practiced in the area as a method of keeping the moisture of the soil when there is too much sun.

The role of cash crops

Crop diversification does not seem to play as much of an adaptation role as it does a cash cropping one. Through trial and error, farmers try to figure out which crops work best in the area. For example one farmer told us how they used to plant tomatoes and had to stop due to vulnerability of the crop to pests (any potential links to climate change were not put forward). They also stopped planting ground nuts, which they found was not suited to the area, and tried to introduce cabbage and potatoes, some of them being explicitly planted for their usefulness as a cash crop. Several farmers told us that they had started planting pigeon peas on recommendation of the government, who had told them that there would be a big market for the crop. This recommendation, which at least 4 farmers that we spoke to acted upon, stems from a memorandum of understanding between Mozambique and India in which India commits to buy a certain fixed amount of pigeon peas from Mozambique. India also promoted the planting of this crop domestically, which last year led to an oversupply and thus falling prices for the cash crop, leaving many farmers in the position of having to accept “a price at which farmers could not get back half the amount invested in production”⁸. Although we were not able to assess the impact that this market fluctuation had on the farmers we interviewed, it goes without saying that the

⁸ <https://www.theigc.org/blog/peas-one-basket-lessons-2017-pigeon-pea-crisis/>

more farmers planted only this cash crop (in some other areas they invested completely in it (ibid), the more they were affected. This potentially serves as a cautionary tale: when these farmers completely depended on the market, even a good year in terms of harvest ended up harming the farmers due to the international market context.

Knowledge of concepts such as “food sovereignty” and “agroecology”

Only one farmer interviewed was able to talk about the term “agroecology”. The term “conservation agriculture” was much more widely used and understood. Despite claims by the one farmer that these are essentially the same, this field work potentially shows how practicing only conservation agriculture can obscure some important political aspects embodied in the term “agroecology”. Conservation agriculture focuses on the technical aspect of conserving moisture in the soil, through the techniques mentioned above. The one farmer who compared the two claimed that agroecology also encompassed the need to take care of the soil, not use chemicals, and ensure sustainability, but the depoliticised approach practiced in general in the area shows an understanding of agroecology solely as a set of practices, rather than as also embodying a movement that achieves food sovereignty. Indeed, not one farmer interviewed, apart from this one (who was the president of UCAMA), knew the term “food sovereignty”. One staff member of UNAC explained to us how conservation agriculture has more of a focus on increasing yields, less so on the ecological aspects, which lead to ecological sustainability of the farm. He explained how rather than being concerned with climate change directly, it demonstrates a concern for the potential effects of climate change on yields.

We eventually discovered that Norwegian

People’s Aid (NPA) has been funding projects in the region for 4 years for conservation agriculture, helping with some desired inputs such as water pumps, cattle, tools for making lines, and training⁹.

As mentioned above, the term “food sovereignty” was not known by all but one farmer, however, they all knew of the term “food security”. The one who did said that he supported people who are interested in cash crops, but only after they had cultivated enough to eat. He rejected certain cash crops that were less flexible however, for example tobacco: *“if you can’t sell it, can you eat it to survive?”* He defined food sovereignty as: *“the ability to farm and choose what you want to eat and produce. As well as being able to choose your diet.”* It became apparent that the term “food security” was more used due to the influence of government and NGOs such as NPA, as well as the United Nations Food and Agriculture Organisation (FAO). UCAMA however, also used this term. Definitions of food security that were given included:

- “It has to do with keeping enough food to eat all year and not face hunger.”
- “It means to have safe and secure food availability.”
- “When you produce, you should have enough food to eat, you can sell but only after you have enough food to eat.”

The absence of the political aspects that food sovereignty expounds was also evidenced in farmers’ approach to seeds. One told us about how they needed to keep buying seeds from the Ministry of Agriculture in town (Chimoio), and how sometimes due to how expensive they are, they don’t have the money for them. A big contribution to this could be the influence of government who recommend cash crops to farmers, such as the pigeon peas mentioned above, which need monetary investment. One farmer spoke of the difficulty in keeping up traditional practices due to

⁹ http://scanteam.no/images/scanteam/pdfs/reports2013/2013_1322.pdf

external influence: *"Local seeds are dying out. People are listening to companies, neglecting their own seeds."*

Gender and UCAMA

The female interviewees told us how their involvement with UCAMA has enabled them to take on roles of responsibility and leadership that were previously not available to them. "Before the organisation, only men used to make decisions. We always believed our voices were not important. Now women hold important positions as well and can make decisions." One female farmer interviewed spoke about how household dynamics based on gendered roles had changed a little: "we can do activities and be away from home for a while without our husbands shouting at us. UCAMA is talking about these two sides [genders] working together". Despite there being some initial reluctance from husbands according to one farmer, this seems to be translating at least somewhat into practice. The women we spoke to are feeling more independent, and essentially freer from their gendered roles: "Women buy things for the household. We have built up confidence, we can do a lot, not expect men to do it for us." According to one farmer, it is also possible for women to own their own land, however, this did not illuminate questions of unequal access to land. With the insecurity of land tenure in general in the area, it is not clear from our interviews (in part due to their scope) how women may be affected differently to men in the area.

Generally, climate change has disproportionate effects on women and girls in Mozambique, since they are more dependent on natural resources for household and agricultural tasks. Women are normally responsible for crop production (men are in charge of livestock) and availability of food and water

for the household. Women's rights and control over natural resources is less than men's, and they are often underrepresented in decision-making bodies. Women's burdens are aggravated if they are left alone by men who migrate to larger cities or even abroad (which is according to some an increasingly common coping strategy to climate-related hazards, while other studies report reduced male migration in recent years). As a result, in many areas over 50% of households is female-headed, and women and girls need to cope with the burdens of reduced water availability and food security (Midgley et al, 2012; Mucavele, 2010).

Land grabbing

The peasants with title are granted the right by the state to use the land, which they have to renew every 50 years. Often, farmers in the area do not have titles nor do they know what they are. Companies such as Portucel (named by one farmer) take advantage of this to dispossess farmers of their land¹⁰. UNAC works a lot with land rights issues and the provincial level government is always open to talking about land rights with UCAMA, who have helped farmers to get titles for their land. However, even when farmers do have titles, companies such as Portucel simply deceive people by promising work, hospitals, or schools in exchange for their land. Usually, they approach individuals rather than community. This demonstrates how privatisation of land does not lead to land security for peasants, indeed often it leads to land concentration (Rozen, 2016). However, if the companies visit the fields and find out that the farmers don't have papers, the companies will lease the land directly from the state and then kick off farmers. As one farmer tells us: *"Some can even take land without consent, when they have papers from Maputo."* This has climate justice implications. Not only are

¹⁰ Portucel has also taken land from peasants with titles. The possession of titles confers some degree of security to the peasants, however, having a title does not necessarily prevent peasants from being dispossessed by companies.

small scale farms being replaced by massive monocropped plantations using the energy intensive methods of the green revolution, but this also makes for more landless peasants who need to make their way in the cities, and have, by virtue of being landless, become much more vulnerable to climate change.

Limited land access is a major restraint for people's options to cope with climate change. Land access restrictions often make it impossible for peasant farmers to move to different areas, and restrict their coping options to changes in planting/harvesting patterns and finding alternative livelihood activities (MER, 2015). This is exacerbated by the government's focus on developing major export corridors which are leading to severe land grabbing or displacement of communities from fertile to marginal lands to the benefits of agribusiness and large-scale commercial agriculture.

Market

Dealing with the market is an added difficulty for farmers who decide to make it an important part of their livelihoods. Crops from South Africa are subsidised (tomatoes, potatoes, apples), so they get to Mozambique cheaper, which makes local foods seem more expensive than they are and forces down prices for local farmers' goods. As three of the farmers told us about, it is the people who come as buyers who decide the price they want to pay for the farmers' crops. Small scale farmers find themselves powerless in this situation because they might lose the product otherwise. *"We suffer because who gets the profit is the people who come to buy our produce, the money we get is very cheap"*. Further pushing the market narrative is the UN FAO, which does provide technical (read depoliticised) assistance: it has demo plots and helps to build seed banks. However, farmers are also taught to be entrepreneurial; *"we are taught that when there is a lot of maize, to wait to sell until there is low supply."* Regarding this market mentality

in general the question then becomes: will a certain crop ever become cheap enough if it is competing with highly subsidised foreign produce?

Final remarks on data

Overall, when it comes to adaptation there is a general focus on conserving moisture for practical reasons, but this focus seems to be at the expense of a nuanced understanding of sovereignty and control over the farm, which surfaces at the point where seeds and crop choices are made. The importance of issues central to food sovereignty such as the choice of what crops to plant, or planting varieties for the health of the family are not stressed so much, and there is also a related general willingness to listen to government recommendations for crops that can make money. Indeed, the possibilities of money making are encouraged (plant these because you can sell them).

Although the message of keeping enough food for your family first seems to be encouraged and is mostly practiced, there is still a majority of farmers that were interviewed that planted cash crops to sell, which if emphasised too much could lead to a dependence on global market dynamics which are completely out of the control of small scale farmers (such as in the pigeon pea example mentioned above). The practices of agroecology seem to be filtering through, as the turning away from chemical fertilizers trend indicates, but whether the political aspect of agroecology is also filtering through is more of an open question. The dissemination of these terms (agroecology and food sovereignty) as they elucidate the political side to these practices that are being adopted, is important if not essential.

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