SUSTAIN PRO

Baseline Report, Mozambique

April 26, 2023

Prepared for: The IUCN SUSTAIN PRO Team, Mozambique

Submitted by: Ipsos Center for Development Research and Evaluation, Maputo, Mozambique

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Vanduzi Landscape. Photo © Ipsos Mozambique

This is a baseline report for the IUCN SUSTAIN Productive Landscapes for Inclusive Growth in Mozambique based on a desk review, key informant interviews, a household survey and focus group discussions.

SUSTAIN Pro commenced field assessments and negotiations with stakeholders in 2022 and covers the Districts of Báruè and Vanduzi in Manica Province in Mozambique. Required information areas were agreed with the SUSTAIN team, and the resulting findings from Mozambique form the focus of this report.

Acknowledgments

We would like to thank **IUCN SUSTAIN** Tanzania, Mozambique and global teams for their help and support throughout the design and implementation of this baseline. Particularly, we would like to acknowledge the support given by, Anthony Mhagama, Calvin Metta, Carla Rombe, Silvia Guizzardi, Isabel Ramos, Maria Lindelien, Maria Ana Borges, and Maria Matediane.

…and finally, we would like to acknowledge the time and effort spent by the men and women who gave their time and views by participating in this baseline. We pledge to them that the findings of this baseline will be used to improve the impactfulness of services provided to them on their well-being and resilience, within this and future programs.

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1. EXECUTIVE SUMMARY

1.1. Background on SUSTAIN Pro

This report covers the SUSTAIN Productive Landscape for Inclusive Growth (SUSTAIN PRO) project in Mozambique, which aims for sustainable food systems and healthy productive landscapes, through:

- Up-scaling solutions for sustainable agricultural production,
- Restoring land health through multi-stakeholder partnerships and,
- Investing in sustainable and inclusive value chains to drive systemic change.

Belas Vanduzi farm. Photo © Ipsos Mozambique

180

Number of interviews conducted (household survey); 90 Male, 90 Female

20 KII and 4 FGDs (2 male, 2 female participants).

SUSTAIN Pro will be implemented in two Districts of the Manica Province in Mozambique: Vanduzi and Barue Districts in the far West of the country. The logic behind the program, as stated in the program proposal, is that learning and employing the right types of financial and technical incentives for integrated landscape management (ILM) and the delivery of nature-based solutions (NbS) on the ground effectively contribute to climate change adaptation and mitigation enhancing resilience of economies, people, and nature. SUSTAIN Pro will focus on changing behaviours in the landscapes and at the national level.

Viable alternatives to harmful growth will be identified and must be available, known, and accessible so stakeholders can be empowered to change but also increase production inclusively. In Mozambique SUSTAIN Pro will work with Associations and Cooperatives of farmers in the mentioned Districts as well as with others, based on knowledge based tools via the Knowledge Hubs.

1.2. The purpose and method of the baseline study

The main purpose of the baseline study for SUSTAIN Pro is to provide an up-to-date, real picture – based upon collected qualitative and quantitative data – of the information areas agreed upon with the SUSTAIN Pro Mozambique team, set benchmarks for later follow up, and to contribute to the finalization of indicators. The study took a partnership approach between Ipsos and the SUSTAIN team for the development of the initial draft results framework and related information areas to guide the survey. The information for the baseline came from a review of literature, key informant interviews with officials and others in the landscapes, a household survey of 180 interviews amongst male and female household decision makers and focus groups with male and female farmers.

This section summarizes the key findings against each information area.

1.3. Factors that limit or enable the adoption and scale-up of priority agricultural practices, technologies and solutions

This section is related to activity 1.1 in the SUSTAIN Pro workplan. Leading into output 1.1. – sustainable and productive agricultural solutions are disseminated.

Key challenges

The key challenges faced by farmers are potential entry-points for SUSTAIN Pro as farmers will be very open to addressing these challenges. Key challenges are the affordability of agricultural inputs (56% mentioned spontaneously in Vanduzi and 12% in Barue), **c**rop pests (44% spontaneous mention in Vanduzi and 37% in Barue) and the high price of food, (63% mention in Vanduzi and 48% in Barue).

- There is a need for SUSTAIN Pro to show how these problems can be tackled through nature based and sustainable solutions, with a particular focus and strong launch of how to deal with crop pests. This can, for example, be tackled through strengthening supply chain of appropriate inputs, and conducting ecosystem assessments/ROAM/SAFs to respond to land health needs.
- Ensure methods are affordable and are promoted as such to farmers.

Another problem is difficulties marketing or selling produce or getting the right price for it (46% call it a big problem), and as noted below, the area of marketing is not well tackled by existing extension services.

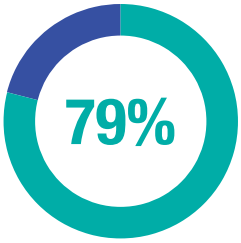
- Improve linkages between farmers and buyers through strengthening associations and cooperatives.
- Include training and initiatives in the SUSTAIN Knowledge Centre on sales and marketing.

Drought / lack of water was spontaneously mentioned by 24% in Barue.

- In Barue, conduct an assessment to understand opportunities for rain water harvesting via dams and at households.

Lack of agricultural finance was the fourth-most highlighted problem

- Agricultural finance is another area of potential intervention, this can be tackled via partnerships with Associations and Cooperatives, through embedding finance with inputs and access to market.



Farmers surveyed claiming to do something to enhance or preserve soil fertility,

Adoption of practices around soil fertility

A majority of farmers surveyed (73% in Barue and 82% in Vanduzi) say they do something to preserve or enhance soil fertility, but only 38% consider soil fertility to be a big problem.

- Enhance awareness of the importance of soil fertility and understanding of its link to productivity now and in the future.

79% claim to do something to enhance or preserve soil fertility, of these, 19% use chemical fertilizers, 17% compost, 16% manure, reducing tillage, planting legumes are not mentioned and only 5% mention crop rotation.

- The fact that many claim to do something to enhance their soil fertility is a positive thing as it shows a disposition to act, however, not all of this activity, such as adding chemicals, is beneficial.
- There is a need to increase top of mind / spontaneous awareness of the use of sustainable solutions, as well as increase use, and reduce the use of chemical fertilizers.

Barriers to use of specific practices around soil fertility

Manure – not available (39%), did not know it is helpful to soil fertility (32%), unhealthy / poisons soil (8%), "there is a myth that circulates that when I use manure the land will rot " (focus group Manica), or "no particular reason" which usually means that respondents had not thought about it, or are doing it by habit.

- Persuade farmers to use manure where it is available and overcome myths about it, and consider how to introduce mixed farming, or improve manure sharing or supply.

Compost – they do not know how to make it (49%), they can make it but did not know it is helpful (22%). This was more widely mentioned by females than males. 10% in Barue said they do not have available plant matter, perhaps indicating the dry nature of the terrain in Barue.

- Promote the use of compost through teaching farmers how to make it.

Crop rotation – a lack of knowledge (47%), not having a large enough farm to do so (18%)

- Train farmers how and why to rotate crops, and how to do it on small plots.

Planting legumes / beans – a lack of knowledge, not knowing it is helpful to soil fertility, the need to prioritize other crops than beans and a lack of money for bean seed.

- Show farmers how to plant beans and make them understand the benefit to soil fertility.

Reducing tillage – The main barrier to this practice is habit, (51%), followed by digging to make planting easier (31% in Vanduzi), to get rid of weeds (25% in Vanduzi), they did not know it was beneficial or consider it harmful.

- With tillage reduction, farmers need to understand its benefits. Raise awareness that there is a benefit in not digging between crops and demonstrate methods of planting and weed removal that does not require full digging.

Intercropping – they did not know it is helpful (23%), or do not know how to do it or which crops to mix (22%), or that they just do not like mixing crops in the same space (19%).

- Show the benefits of intercropping and how to do it most beneficially. There will need to be persuasion to overcome habits of not mixing crops.

Overall, the key intervention points are around awareness raising and persuasion, training, or demonstrating to farmers how to do these techniques, and ensuring they understand and believe in the benefit of them.

Adoption of practices around control of pests and diseases. This is the biggest challenge farmers face, and most (71%) try to do something about it (78% in Vanduzi and 58% in Barue).

SUSTAIN Pro can ensure farmers are helped in this area. The only significant practice mentioned spontaneously is spraying with pesticides (63%). Men are more likely to say they do that than women, and in terms of farm roles, men are more likely than women to be involved in the procurement and use of inputs including pesticides and fertilizer. On prompting with a list of things that could be done, the most common method mentioned is spraying on chemical pesticides (74%).

The high awareness of and focus on chemical pesticides is likely to be because these areas are under the national agricultural program **Additional Financing to the Agriculture and Natural Resources Landscapes Management Project (**SUSTENTA), which focuses on accelerated production using any method, most notably through the application of chemical fertilisers and pesticides and other inputs.

- There is a need to convince local and regional authorities of the effectiveness of the SUSTAIN Pro approaches via presentation of the pilot program to **Agencia de Desenvolvimento Economico da Província de Manica** (ADEM) and the Provincial Agricultural Director.

Cost is said to be the main constraint on use of chemical pesticides, and it is the main reason for doing nothing about pests.

"The problem is price. Before last year it was 1880-2000 meticais [$28-$31 USD] but at the moment it's 2500-2900 meticais [$39-$45]. I have children at home who go to school … to afford everything at once is difficult" [Women from Barue focus group].

- Considering the prohibitive price of purchasing chemicals, we can conclude that farmers will be open to some of the nature-based methods of controlling pest and disease providing these are at high value – i.e. more effective for a lower price. There is a need to sensitize farmers to these methods as appropriate.
- The affordability and cost-effectiveness of sustainable solutions will be a big selling point and should be fully proved to farmers and explained by SUSTAIN Pro.

Reasons for not using sustainable practices for pest-control

<10%

Do not know how to do sustainable practices for pest-control

Most sustainable practices were mentioned by < 10% **"not knowing how to do it"** is the main barrier for a wide range of approaches, indicating low level of awareness of these methods

Weed control: Male and female survey respondents in both districts say they do something to control weeds and most currently weed by hand (76%). Very few can afford to spray chemicals to get rid of weeds, and organic solutions are also not widely known about.

Soil erosion: Soil erosion is common (65% of farmers mention it), though only 36% say it reduces farm-productivity. The main causes are said to be rain washing soil off, and floods and overspill from rivers and dams. In the landscape, exposure to the surrounding mountains, creates erosion but also water provision and provision of soil minerals that can be beneficial. On the other hand, illegal small-scale mining accelerates mountain erosion and causes mineral particles to be brought with the water, and this needs to be assessed to see how harmful they are.

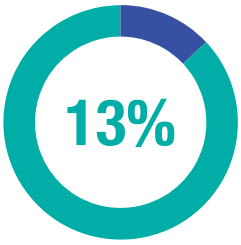
Just under half of farmers (48%), significantly higher in Vanduzi (53%) than in Barue (37%), say they do something to control soil erosion. Men seem better informed in this regard than women (57% compared with 39%). The most common practice mentioned spontaneously is to build a wall, a stone perimeter or to dig a ditch (43%)

The barrier to controlling soil erosion is that they do not know how to do it or need more information (35%). Others said that it is too expensive (12%) or they had never thought of doing anything about it (11%).

- There is a need to further enhance awareness of the negative consequences on soil health of soil erosion.
- Train farmers on what they can do to prevent soil erosion.
- Where harmful minerals are identified in water, one solution is to create water deposits for miners to wash the minerals. Sediment control products can be used to filter and reduce the water flows' movement through an area. Ponds, trenches, and holding areas can also be filtered through products such as dewatering bags (permeable geotextile fabrics) to collect fine grain sand, contaminated soil, dredge waste and other materials while allowing water to pass through. Dewatering and sediment control products are excellent water pollution solutions (SDWF 2017).

Water and irrigation: Water consumed at the household is from rivers (34%), wells (25%) springs (19%), mains (12%), or dams (11%). For farming, 79% do irrigate or water their crops, at a similar level across the districts and genders, and 77% say it is very beneficial to them. Nearly all do this by hand, and they say they are very reliant on using irrigation to produce adequate income from their farm, since rainfall is not enough to water crops. Only 27% say they are only a little or not at all reliant on irrigation. Sources of water for farming in Barue are rain (57%), and river (33%) and in Vanduzi are river (35%), rain (28%), and spring water (25%). Female respondents are more likely to say that their household relies on rain-water for farming than male respondents, however, most of the farming in the landscape is rainfed. Those who do not capture rainwater in a dam or from the house (10%), are prevented by not knowing how to do it (32%), not having enough rain (19%), that it is too expensive (11%) and habit / not having thought about it (10%).

- There is a need to help farmers explore rainwater catchment where this is feasible, and use drought-resistant varieties.



Farmers who know of an organization providing loans to farmers in the landscape

Women are less aware than men

Access to agricultural finance: Farmers face problems with the affordability of inputs, yet there are low levels of finance available in the landscape. Only 13% know of an organization providing loans to farmers in the landscape and women are less aware than men. Organizations known were farmers' groups, cooperatives or associations, village savings and loans societies and micro-finance organizations. The main reason for not getting loans are that small-scale farmers are not trusted by financial institutions due to their low education (31%), especially of concern amongst farmers in Vanduzi (38%) compared with Barue (15%), or that they lack collateral (19%), or lack financial institutions to provide a loan (14%). Without collateral, gender inequality is deepened in that women cannot access credit, which leads to difficulty obtaining land and other assets, and making investments in agriculture. The difficulties in access to credit are linked to the lack of identification documents, in-existence of guarantees, difficulty in formalizing business plans, and poor penetration of the banking system, among other aspects. A personal mobile money connection, which is a way of saving money and can be connected to other financial products, is owned by 71% of men compared with 21% of women. As a result of extensive exclusion from formal credit systems, women usually resort to informal group saving mechanisms that involve the revolving credit system (See Akinboade, 2005).

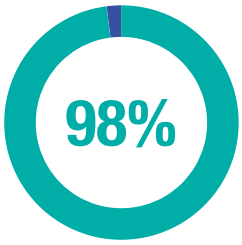
- There is a need to make sources of agricultural finance more accessible to and better known by farmers in the landscape.
- From the fact that very few respondents in the survey could mention a financial institution, we can deduce that there is a need for more organizations offering loans to farmers, including female farmers, in the landscape.
- This could be provided through farmer associations and cooperatives, and indeed these currently do receive support from SUSTENTA AND FAO, so should be providing finance, though this may not be widespread or impactful enough.
- What institutions that are present may be engaging more with men than women. This could also be related to the high disparity in education and literacy between men and women, and any such bias needs to be overturned. There is a need to specifically target women who are seeking finance, with help and information in a digestible way, and ensure that products are administratively adapted to be available to women.
- Engagement with savings groups could be explored as a way of strengthening finance in particular to female to farmers.
- Formal institutions apparently need to provide better services in the landscape, and there is a need to enable women better access to mobile money services. Mobile money is a way of ensuring that people have access to financial services. Mobile money is fairly widespread and could be used for some farmers to receive or pay money. However, women would be largely excluded from this.

Access to extension services: Extension is particularly important because populations in the landscape are reliant on agriculture for livelihoods, food security and improved welfare. However,

- Agricultural productivity is still low.
- Farmers organizations are still largely underdeveloped.
- Agriculture is largely dominated by small scale farms and some medium scale farms that account for 99.3% of the total farms (Censo de Agro-pecuaria,2009-2010), most of them facing a plethora of farming and market related constraints, as we have seen from the survey findings.

The role of extension in contributing to improved agriculture performance is well known, particularly in technology transfer, farmers' organization support, facilitating of market linkages and natural resources management (Hanyani-Mlambo, 2002). Extension services in Mozambique are provided by

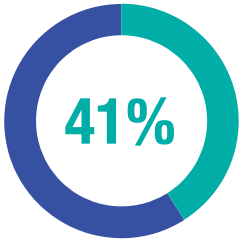
- The government, such as via SUSTENTA
- NGOs, and
- Private companies.



Farmers, across both districts and genders, reported needing information and training

However, 89% of farmers, across both districts and genders, reported needing information and training but only two-thirds, had received some in the previous 12 months, with women being as likely as men to have received information. However, very few, only 22%, are very satisfied with the amount or frequency, or quality of the information, with men being more satisfied than women, indicating a gap for women in the adequacy of the amount of information they receive.

- There is a strong need for agricultural advice, information, and training in the landscape, which is not adequately met currently, and this gap can be closed via the Knowledge Centre. The SUSTAIN Pro Mozambique team have already discussed with ADEM and agricultural services how to compliment SUSTENTA extension workers staff time.



Ministry of agriculture extension officers is the main information source

Sources of information: Ministry of agriculture extension officers (41%) are the main information source, followed by a group, cooperative or association of farmers (24%), in Barue (42%), more than in Vanduzi (16%). Women are at least as likely as men to receive information from farmer groups, cooperatives or associations. Village or community meetings were also mentioned as an information source, and men were more likely than women to get information from them. This is because men are more likely to be leaders at village meetings than women, according to focus group discussions, and the meetings may be male dominated, though the survey did not capture information on the gendered participation in village meetings.

- The SUSTAIN Pro team should engage with government extension officers to assist in the provision of beneficial information, and indeed discussions have already taken place with ADEM on how to compliment SUSTENTA extension workers staff time.
- Information from farmer groups, associations and cooperatives is not as widespread as it could be and is not a primary source of information to these farmers, which provides an entry point for the SUSTAIN Pro program to work with the associations and cooperatives to strengthen this.

Type of information received was on best farming techniques (68%), followed by seeds (40%) and fertilizer (34%). Very little advice was received on diseases, pests, marketing and selling despite these being key problem areas mentioned by farmers, though dealing with disease may have been encompassed under "best farming techniques".

- Ensure information on marketing and sales and on disease is well covered in Knowledge Centre activities.

Based on perception, most respondents (94%) believe that men and women have equal access to farm information, training and help, the few respondents who feel that women have less access than men felt it is because they focus on other activities such as taking care of their home, or that women are not able to perform certain farm activities.

- The perception that women have equal access to information as men is not based in reality and this myth should be dispelled through information wherever possible.

1.4. Understand reaction to and impact of the new land legislation

This relates to Activity 1.2.1 "Engage land use planning structures and law enforcement for land use and land management to validate prioritised solutions and map opportunities for roll out in intervention.", and Activity 1.2.2 "Help secure equitable land tenure and other user rights for women and men")

Background on The land law: The new Land Law (Law 19/97) was passed by Mozambique's Parliament in July 1997, providing all Mozambicans with the right to use and enjoy the land, recognized by the possession of a DUAT (Direito de Uso e Aproveitamento da Terra or "right to use and exploit land"), that women and men can obtain. There are three ways of issuing DUATs.

- To local communities as a perpetual single DUAT for land which recognizes that the customary norms and practices also determine individual and family land rights within the community.
- Individuals occupying land in "good faith" for at least 10 years have a perpetual DUAT for residential and family use.
- Individuals can apply for a DUAT for up to 50 years (with one renewal) and a land rights concession, typically for natural resource extraction or developing agricultural, forestry, or fishing activities.

DUATs obtained by customary and good faith occupation are perpetual and do not require plans for use of the land. However, if communities want to formally register their DUAT, they must prepare an exploitation plan and can obtain DUATs for individual plots but have to go through a process of consultation with their local leaders.

Mozambique's legal framework should ensure equal rights for women and men, because it makes the right of individual persons (men and women) explicit and clear in the law. The legislator wished to stress that the right can be held by women independently of male guardianship. The Land Law of 1997 officially recognizes women as co-title holders of community-held land and further states that all community members (and therefore also women) should participate in decision-making processes.

- Within the associations, there is a need to establish long-term land rights for both women and men so as to encourage long-term sustainable solutions

Reaction of stakeholders to the land law: When asked about the new land law, stakeholders interviewed felt positive about it, saying "it gives access…to all Mozambicans", and "women also have the right to use the land" and "in the community a person even without a Duat for himself has the right to use the land as usual".

However, several interviewees had criticisms of the law, most of which fall into a single category: lack of public knowledge. Governmental and non-governmental actors in Mozambique support this and say that while the legislation is progressive it is not strongly implemented (USAID 2021). Large numbers of rural residents lack the capacity to secure these rights in practice, basically lacking the money and technical understanding required to go through the process. The low levels of literacy of women in the two Districts in our landscape, as shown in our survey, must make it particularly difficult for them to assert their rights.

Also, because the Land Law supports both smallholder land-rights and encourages private investment, local people can be vulnerable to having their land seized by elites or foreign investors who argue that they can bring unused land into better production than small-holders. This makes it difficult for those without formal land documentation to defend their land rights against third parties. Of course, it also means that they are averse to making longer-term investments.

- There is a need to raise awareness of the land law in Mozambique. This could be provided a function of the knowledge centre, working perhaps with partners.
- Also, a range of agencies working in Mozambique suggest that governments' implementation capacity needs to be enhanced.
- The centre could facilitate or provide advice on the establishment of community DUATs.

Another concern is that since 2020 the 1997 Land Law and other laws governing land are being revised to encourage investments ostensibly to address "rigid policies and laws" that have hindered agricultural investment in the country, and it is feared that changes in the law could dilute the rights of communities.

- SUSTAIN Pro could advocate for the protection of community rights under the law at the national level through partnerships. Indeed SUSTAIN Pro have been considering engaging with non-governmental organizations that work with the land law and validation of land titles such as Verde Azul, Terra Viva and Joe Monteiro.

Women are disadvantaged in their access to land and other natural resources

- According to the National Directorate of Land, in 2015, only 20% of DUATs were registered to women and 80% were registered to men (Adriano and Machaze, 2016).

Women gain access to land through their husbands, fathers, uncles, or brothers

Reasons for low land ownership among women: In the survey, half of respondents do not know why their household does not have official documentation, most likely indicating that they are occupying it by custom, a tenth say that it is because men are more likely to own land than a woman, or that there is not enough money to process the documentation. The literature review indicated that patriarchal system and normative customs are the main limitation on women owning land. Women do not obtain DUATs because they usually obtain their rights through customary norms and practices that do not follow national laws and women's rights are defined through their relationship to men: women gain access to land through their husbands, fathers, uncles, or brothers. The head of the household, controls access to land. The lower educational level achieved by women and in particular their relatively lower level of literacy compared with men, as seen in this report, means that men may find it easier than women to go through the necessary administrative steps to gain access to land. This low literacy may further affect women's ability to assert and stand up for their rights.

In the case of marital separation or death of a husband, the woman can get left with no assets.

- Thus there is a particular need to raise awareness amongst farmers of the ownership rights of women, amongst both male and female farmers, and strengthen the implementation of land tenure processes to the benefit of communities and especially to women, in the landscape.
- The SUSTAIN Pro Mozambique can address this gap via the Knowledge Hub and the Training of Trainers program.

21%

Female-headed households in the center-north of the country are on average less productive than male-headed households

US$117

Average income received by the household in the past 4 weeks

1.5. Information to feed into the gender strategy

Income sources. Farming is by far the main income source for both male and female respondents' households. However, across developing countries, including Mozambique women face gender-specific constraints that reduce their productivity and income, and limit their contributions to agricultural production, economic growth and the well-being of their families, communities and countries (FAO 2011). In Mozambique studies show that women farmers are 20 – 30% less productive than men, due to lower access to resources such as land, finance, technology, training, information and knowledge (FAO 2011). In Mozambique, Morgado and Salvucci 2016 found that female-headed households in the center-north of the country are on average 21% less productive than male-headed households. When this is reversed there are significant benefits – their families would enjoy better health, nutrition and education. If women had equal access to agricultural resources and services, food security would be greatly improved and societies would grow richer, and not only in economic terms.

- The heavy reliance on agriculture means that any changes with income from agriculture will immediately affect the welfare of households in the area.
- It is particularly important to focus on women who are disadvantaged in a number of areas as we have seen (for example, lower access to extension information), to enable them make a substantial contribution go the local economy and the health and welfare of their households.

Income. From the survey, the average income received by the household in the past 4 weeks, based on the estimates of the respondents, is 11,326 Meticals, approximately US$177. This is much higher according to male (15,022 MTs), compared with female respondents (6,422 MTs).

- Households in which women were the main respondents, are clearly poorer than those in which men responded, indicating a greater degree of vulnerability. Even where a woman is in charge of a household and farm, she is likely facing greater difficulty maximizing her productivity and sales than male headed households in the same area.
- As planned, the inclusion of women in the activities of the SUSTAIN Pro program in Mozambique are critical.

Land ownership. Land ownership is heavily biased towards men in Mozambique, and in the landscape. The lack of ownership of land puts women in a vulnerable situation in many respects, as she can lose her land if the marriage splits, is less able to access finance, but further than that, may mean that women have less control over farm decision making than men, who consider they are ultimately in charge since the land is theirs. This attitude is likely mirrored by government and other officials in the landscape.

- Achieving equality in ownership is an important objective of SUSTAIN Pro, and there is a need to be aware of and fight against bias at all times.

Education and literacy. Women are fundamentally disadvantaged in that they are less well educated than men. A majority of respondents had attended formal school, 88% of those in Barue, and 82% in Vanduzi, but this was much higher amongst men (96%) than women (72%). Only 18% had completed secondary education. The disparity between the educational achievement of men and women is stark here, with 30% of men claiming to have completed secondary compared with only 6% of women. A quarter in Barue and almost a third in Vanduzi, cannot read or write. There is a big gender gap here also, with only 42% of female respondents able to read and write compared with 97% of male respondents. As a key informant from the Mozambique Agricultural Research Institute put it, "It is women who face more difficulties than men, with two aspects combined, first there is the issue of illiteracy, which she does not even have confidence in herself, then there are cultural issues which say that in a family the husband is the one who should be in the front of everything". There is a strong correlation between income and education in Africa. The low income of female households will be linked to their lower literacy.

- This implies that complex ideas may take some time to explain to some community members, in particular women, and participatory and demonstration-based approaches to instruction should be used to ensure understanding.
- This level of illiteracy will obviously constrain some of the communications methods possible for SUSTAIN and partners.
- Literacy has an impact not just on ability to read communication materials, instructions on products and so on, but also on confidence. It is important that any interactions with farmers ensures that the low levels of literacy of women is taken into account and that male counterparts in the household do not receive all the training and information because they come forward and volunteer more enthusiastically.

10.5-11.3m

Population in absolute poverty

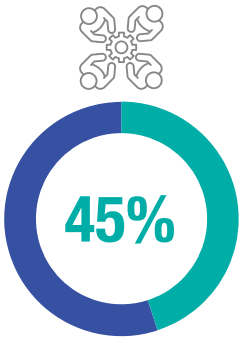
Progress Out of poverty Index: Estimates of poverty rates are between 41 and 46 percent of the population, reflecting between 10.5 and 11.3 million people in absolute poverty.

At the national level, welfare levels have improved when compared to the results of the previous surveys. The gains, however, have not contributed to the convergence in levels of well-being between urban and rural areas and according to geographic regions. In 1990, Mozambique was one of the poorest countries in the world, with poverty estimated at 80 percent of its total population. At the time, a Millennium Development Goal (MDG) to halve this proportion was a very difficult target to achieve. After the "war of destabilization" in 1992 and particularly since the beginning of the new millennium, Mozambique has enjoyed stronger growth and stability. However, between 2002/03 and 2008/09 the poverty reduction process stagnated. Between 2008/09 and 2014/15, the Mozambican economy continued to grow, as before, at a steady pace.

- At the national level, welfare indicators have improved when compared to 2008/09. The results indicate that Mozambique has come very close to the MDG target: poverty estimates are between 41 and 46 percent of the population (reflecting between 10.5 and 11.3 million people in absolute poverty).
- Difficulties with the data have led to consumption poverty estimates that are less accurate than desired. However, using official data (without correction for underestimation of consumption in either year), poverty fell by more than five percentage points when compared with 2008/09.

Hunger: A fifth said there was a time in the past 12 months when someone in their household was hungry but did not eat. Women were much more likely than men to say that their household had gone hungry in the past 12 months, possibly because they are more aware than men of the food situation of the household, but also because the poorer nature of households where women responded also means that they suffer greater hunger. It is much more widespread in Vanduzi, where 28% had gone hungry than Barue where only 7% claimed to have been hungry.

- The benefits of preventing or reversing soil degradation and reducing harvests can abe linked to increased food production and prevention of hunger situations in households. This will be very motivating for households.



Respondents who say that the farmer producer group they are a member of has a mix of equal numbers of men and women

Group membership: Farmer producer groups and savings groups are the group types most widely known to be present in the area in which the respondent lives followed by local committees and similar. For most group-types known of both men and women are accepted as members. 45% of respondents say that the farmer producer group they are a member of has a mix of equal numbers of men and women, but for 40% say there are more men than women, and 14% say there are more women than men. Similarly, thinking about the management committee of the farmer group they are a member of, 39% said it is a mix of men and women, 36% said it had more men than women, and 16% said it has more women than men. There therefore appear to be more male than female members of farmer producer groups, and more men on the management committees, though women are at least represented.

- SUSTAIN Pro can work with the Associations and Cooperatives in the landscape to ensure there is good representation, involvement and engagement of women as well as men.

Farm activities: All the farm activities asked about, were either considered to be done more by men, or by both women and men, none of the activities were considered to be done more by women. Men are more likely to be considered mainly responsible for operating machinery, dealing with pesticides and fertilizers, compared to women.

- In addition to ensuring that women are not excluded and are equally as well trained on any new methods as men, it is very important to engage with men in particular when discussing replacements for chemical pesticides and fertilizers, as they are the main gate-keepers in these areas.

Life roles: When it comes to responsibility for different life roles, a large majority of respondents feel that working on the farm, working in positions of leadership in government, speaking out a public meetings and managing farmer associations and cooperative meetings, should be the responsibility of both men and women equally. Roles much more likely to be considered the responsibility of men than women are getting a job outside the home, deciding how to run the farm, and owning land. This compares with only very few who feel that getting a job outside the home, deciding how to run the farm, owning land, managing associations and cooperatives, speaking out at public meetings, working in leadership positions in government and working on the farm, should be the main responsibility of women.

- So, in other words, whilst most people respect that these roles may be done equally by both men and women, very few feel they should be done by women only, but many still think they can be done by men only. This indicates a gender bias in the beliefs about gender roles in the landscape.

There is widespread recognition that women can pay key roles such as managing associations and cooperatives meetings, alongside men.

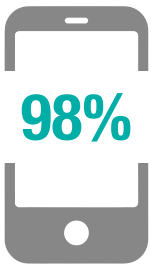
- However, generally there is a need for the SUSTAIN Pro team to recognize the biases present in the community, and ensure that focal areas or activities are not influenced by these biases.

Decision making: According to the survey findings, there is very little different in male vs female involvement in decision making about food and cash crops (67% v 68%) and cash crop farming (58% vs 53%). Men were more likely than women to say that they participated in decision making about poultry raising (51% vs 42%), livestock raising (50% vs 38%), wage and salary employment (52% vs 33%) and non-farm economic activities (small business, self-employment etc) (42% vs 37%).

- Thus the main areas where women have less say is wage and salary employment, and livestock.

When asked who in the household makes the final decisions concerning crops to be planted, input use and the timing of harvest, most respondents in Barue and half in Vanduzi said that the man makes the decision. The next most common response was that the decision is made jointly. Only 14% say that women alone make the decisions, though amongst female respondents, this does go up to 26%.

- Whilst both men and women are involved in decision making though the overall power on the farm is in the hands of the man, so the man is a key gatekeeper to change on the farm.



Own at least one mobile phone in working order

Mobile phone access: Nearly all of the households at which the survey was conducted (98%) own at least one mobile phone in working order. A majority, 78%, of respondents own a personal mobile phone in working order which is connected to a sim and network. This is higher in Barue than Vanduzi, and higher among men (93%) compared with women (62%). A further 21% of women have access to a phone that they can use if they want, however, there are usually constraints associated with this kind of mobile phone access because of difficulties accessing the phone or paying for airtime.

- At this level of ownership, mobile phones are a viable tool to use as part of project implementation methodologies, though there is a need to ensure that no women are excluded because of this.

2. THE SUSTAIN PRO PROGRAM

2.1. The SUSTAIN PRO program

SUSTAIN PRO aims to effectively contribute to climate change adaptation and mitigation enhancing resilience of economies, people, and nature in targeted landscapes in Mozambique. It is based upon the premise that Integrated Land Management (ILM) can play a critical role in halting biodiversity loss and reversing ecosystem degradation while contributing to sustainable and inclusive economic growth and equitable sharing of the benefits of ecosystems. The SUSTAIN initiative is being implemented by the International Union for Conservation of Nature (IUCN), in partnership with African Wildlife Foundation (AWF) and SNV Netherlands Development Organization.

Moniquera farm: Photo © Ipsos Mozambique

SUSTAIN Productive Landscapes for Inclusive Growth (SUSTAIN Pro) aims for sustainable food systems and healthy productive landscapes in Mozambique, through:

- Up-scaling solutions for sustainable agricultural production,
- Restoring land health through multi-stakeholder partnerships, and,
- Investing in sustainable and inclusive value chains to drive systemic change.

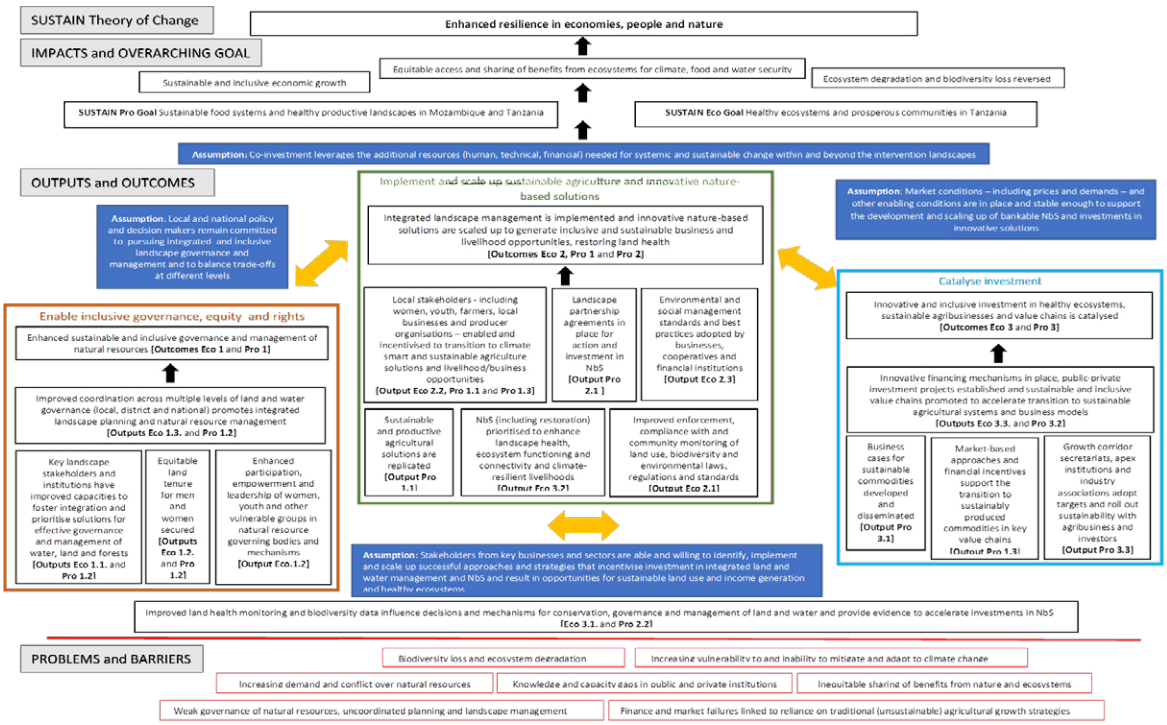
2.2. Theory of change

The theory behind the program, as stated in the program proposal, is that learning and employing the right types of financial and technical incentives for integrated landscape management (ILM) and the delivery of nature-based solutions (NbS) on the ground, effectively contribute to climate change adaptation and mitigation enhancing resilience of economies, people and nature. SUSTAIN must overcome several barriers in order to deliver these outcomes and bring about the needed change. Barriers include:

- Weak governance of natural resources,
- Uncoordinated planning and landscape management,
- Knowledge and capacity gaps in public and private institutions (including information on socio-economic,
- Environmental and health benefits of transitioning to sustainable agriculture practices and scaling up nature-based solutions are not recognized,
- Finance and market failures linked to reliance on traditional (unsustainable) agricultural growth strategies,
- Inequitable sharing of benefits from ecosystems, and
- Increasing vulnerability to and inability to mitigate and adapt to climate change.

The diagram below provides the program's theory of change, incorporating both SUSTAIN Eco and Pro.

Figure 1. SUSTAIN Eco and Pro Theory of Change



2.3. Program activities, outcomes and outputs in program proposal

As per the project documents1, SUSTAIN Pro will focus on **changing behaviours** in the landscapes and at the national level. Viable alternatives to economic growth that is harmful to the environment and long-term agricultural sustainability will be identified and must be available, known and accessible so stakeholders must be empowered to change but also **increase production inclusively**. Emphasis is on disseminating successful on-farm/operational solutions that have the potential for replication, scale up, and addressing the institutional barriers preventing this from happening. It has been designed as a 10-year initiative with an operational plan for the first three years from 2022 to 2024. The delivery strategy encompasses: (i) upscaling solutions for sustainable agricultural production; (ii) restoring land health through multi-stakeholder partnerships, and; (iii) investing in sustainable and inclusive value chains to drive systemic change.

The following summarizes the key post-inception phase activities as per the project proposal[1].

Outcome 1

Entails that **solutions for sustainable agricultural production are scaled up**, and to achieve that SUSTAIN Pro will focus on changing behaviours by making viable alternatives available, known, and accessible. Thus, it focuses on identifying alternatives and providing pathways for their uptake. This will involve disseminating successful on-farm/operational solutions that have the potential for replication and scale up and addressing the institutional barriers preventing this from happening. The outputs expected under Outcome 1 are that **sustainable and productive agricultural solutions are disseminated (output 1.1)**, which will involve building capacity of intervention landscape stakeholders to implement sustainable and productive agricultural solutions and disseminating priority solutions through investments and partnerships.

Output 1.2 which is that **governance institutions and processes are strengthened to build an enabling environment** which will involve engagement with land use planning structures and law enforcement for actual land use land management plans to validate prioritised solutions and map opportunities for roll out in intervention landscapes. The project will also help secure equitable land tenure and other user rights for women and men, improve inclusion and governance in selected outgrower schemes and forest and farm producer organisations and strengthen integration and coordination between local, district, and national level governance for land and water for coherence in NDCs and NAPs implementation. **Output 1.3,** that **market-based approaches and incentives help transition to sustainable agricultural systems**, involves assisting smallholders to produce value-added products competitively, providing incentives to support the adoption of adjusted sustainable production practices and improving the sustainability offering of public and private extension services

Outcome 2

Will be that **land health is restored using landscape partnerships**, which will involve facilitating dialogue amongst different stakeholder groups and sectors to influence individual and collective action on natural resource governance, sustainable resource management and use. In terms of outputs, this will ensure that landscape partnership agreements are put in place for action and investment in nature-based solutions. **Output 2.1** involves conducting a landscape diagnosis, Including stakeholder mapping, development of shared landscape vision and plans, and negotiating landscape partnerships. It also aims for **Output 2.2,** that a **land health monitoring influences permanent governance mechanisms for land and water**, involving developing a monitoring index, engagement with local to national governance mechanisms to promote the uptake of nature based solutions in agriculture and publishing supplements to NbS global standards for agriculture.

Outcome 3

Aims to stimulate **investment in sustainable value chains accelerates transition to sustainable food systems**. This focuses on vertical integration of on-farm and broader landscape solutions, linking to value chains, agribusiness and apex and business association as well as financial institutions to mainstream change. It has a component focused on mainstreaming sustainable and inclusive policies and practices and another on channelling investment to sustainable agricultural development alternatives that also enhance productivity, sustain land health and deliver economic returns. Under this, **Output 3.1** aims to develop business cases for sustainable commodities. **Output 3.2**. aims to stimulate public/private investment projects to scale up sustainability and inclusion in value chains, and **Output 3.3** targets growth corridor secretariats, apex institutions, and industry associations to adopt targets and roll out sustainability with agribusiness and investors.

1 Productive landscapes for inclusive growth in Tanzania and Mozambique, Sustainability and Inclusion Strategy for Growth Corridors in Africa (SUSTAIN Pro) Proposal, IUCN 2021

2.3.1. Planned program activities in Mozambique

The above general proposed activities were prioritized based on the specific needs in Mozambique. In Mozambique the SUSTAIN team will be working with the Agencia de Desenvolvimento Economico da Província de Manica (ADEM) which is the local economic development agency of Manica. This will be their local focal point institution and key counterpart and implementing partner.

As per the initial briefing workshop by the SUSTAIN Pro Mozambique team,[2] the key focal areas in Mozambique are:

- Sustainability and restoration of agricultural soils
- Sustainability of value chains: corn, soy and products from conservation areas such as honey, coffee and bamboo
- Knowledge centres on sustainable management, nature-based solutions and ecosystem services

The major objectives of the program are:

- Greater sustainable production capacity – that is green and inclusive,
- Improved partnerships and private investments,
- Greater access to soil production, management and restoration techniques,
- Greater climate resilience and water management, and
- Improvement in community life,

and the planned implementation approaches are:

- Technical assistance to improve territorial management plans, with a focus on resilience, climate change and sustainable land use management,
- Transition from current forms of production to greener and greener production and value chains,
- Use and sharing of knowledge / knowledge centres to accelerate development capabilities,
- Implementation for this transition and better land use, and
- Use of a pilot / demonstration area for organic production.

2.4. The results framework

The results framework for SUSTAIN Pro was discussed at the inception phase of this baseline study. The existing SUSTAIN Pro framework was used as a starting point, and then various calls and discussions were held with the SUSTAIN team in Mozambique and globally to adapt this to the anticipated realities of the program on the ground. The results framework is published separately from this document.

2 Presentation by SUSTAIN PRO team in Maputo, 19 de Maio de 2022

3. THE BASELINE PURPOSE, OBJECTIVES AND SCOPE

3.1. Baseline purpose

The main purpose of the baseline study for SUSTAIN Pro is to provide an up-to-date, real picture – based upon collected qualitative and quantitative data – of the current socio-economic and ecological situation in targeted landscapes in Mozambique, set benchmarks for later follow up, and to contribute to the finalization of indicators. The baseline also generates evidence to inform program activities and planning.

Interviewing occurring in Moniquera area. Photo © Ipsos Mozambique

3.2. Baseline scope and objectives

The following are the objectives areas that the baseline set out to address:

1) Assess the factors that limit or enable the adoption and scale-up of priority agricultural practices, technologies and solutions (relating to Activity 1.1.2).

- What is the status of priority agricultural practices, technologies and solutions across the landscape?
- If not the priority solutions, what is currently being done in these farms?
- Are priority solutions adopted in any location? Why / what has facilitated their adoption?
- What are reasons for non-adoption amongst farmers, low level of adoption or lack of change (awareness, structural or individual inhibitors – Ipsos MAPPS framework)?
- Where good agricultural practices, technologies and solutions have been adopted by farmers, what made that happen? In what context? What facilitated uptake?

2) Understand reaction to and impact of the new land legislation (Relating to Activity 1.2.1 "Engage land use planning structures and law enforcement for land use and land management to validate prioritised solutions and map opportunities for roll out in intervention.")

- What is the description of the new legislation that has been introduced? What do we consider as new?
- What do all the value chain actors and the local authorities feel about the new legislation? Strengths, weaknesses, concerns?
- What is the likely land legislation implication and impact on land at the community level? (in terms of use of land, inclusion of women and youth)

3) Verify the current situation with regards to land access and rights amongst men and women (relating to Activity 1.2.2 "Help secure equitable land tenure and other user rights for women and men")

- What legislation and policies are in place relating to land tenure, land access and land rights? To what extent, if any, does the legislation actively include or legislate for the inclusion of women? And what is the degree of implementation?
- How much are or were women involved in the structures and implementation of policies that govern land ownership? Why and why not? (policy design, regulation design, implementation and decision making on land issues and conflicts).
- Overview of land tenure, rights and ownership in the landscape and barriers to gaining land tenure. Who is excluded and why? What are the issues? What is the gender situation with regards to land tenure, and barriers to female ownership?.
- Number of individuals (disintegrated by gender and age) with secured land tenure
- Gender issues and conflicts over land tenure and other natural resources
- Access to finance and extension services for women vs men

4) Identify and describe key stakeholders involved in managing the landscape (Relating to Activity 2.1.1 "Consultative landscape diagnosis, including stakeholder mapping, risks and opportunities assessment for nature-based solutions")

5) To provide information to feed into the gender rapid assessment

- Extent to which land governance structures are currently implementing inclusive management of national resources governance, what this looks like and what the barriers to inclusivity are (inclusivity as defined in the SUSTAIN project documents).
- Extent to which citizens are involved in any of this governance, if at all, particularly differences between women and men. Where is the control and power in the structure? What are the profiles of those excluded? What is the participation and role of women, youth and vulnerable groups in governance, leadership and decision making?
- What are households' income sources?
- What are the roles of women and men in the household with regards to decision-making in different areas?
- What are the level of responsibilities men and women have in cooperatives and associations?
- To what extent can women make decisions about the cooperative/association (involvement in coop, involvement in decision making structure of the coops)?
- What are the farm level responsibilities of men and women?
- To what extent can women make decisions about the farm?

6) Provide methods of soil testing and identify suppliers for soil testing.

7) Inform a revision of the results framework and MEL plan

4. BASELINE METHODOLOGY

4.1. Overview

The baseline commenced with an inception phase in which the SUSTAIN team briefed the Ipsos team on the program and intended activities, and some time was spent agreeing changes to the results framework, and based on discussions around those, identifying the key information needs of the team in Mozambique. The study design is mixed method using literature review, interviews with key informants, a household survey and focus group discussions (FGDs).

Cabbage farm in Vanduzi. Photo © Ipsos Mozambique

The following sections outline the method and activities for each evidence area:

4.2. Literature review

A review of literature was conducted of government documents, studies and reports on the landscapes, including those from the previous SUSTAIN project. These documents were identified via an on-line search of key terms and through recommendation from key informants, and also some findings from the SUSTAIN previous report where captured to this report. A bibliography is provided in the appendix.

4.3. Key informant interviews

Following the identification of information areas that needed to be covered, a list of key informants was drawn up by the SUSTAIN and Ipsos teams, to be targeted by the baseline. A semi-structured questionnaire was developed that was adapted depending on the particular background of the respondent and was provided to and agreed by the SUSTAIN team prior to commencement. It was anticipated that the interviewers would take most of the information provided and fill out the paper copy questionnaire, thus allowing for quick analysis. However, in the event of fieldwork, the respondents provided extensive information and as such it was necessary to record, transcribe and analyze the information in a qualitative manner, and this somewhat delayed work.

Individuals at the following institutions were interviewed as part of the key informant interviews. In total we did 20 key informant interviews.

Table 1. List of institutions for key informant interviews

Department or organization	Sector	Website	Description
DPASA – Direcção Provincial de Agricultura e Seguranca Alimentar	Gov	www.pmaputo.gov.mz/por/Informacao/Informacoes-por-Sector/Direccao-Provincial-da-Agricultura-e-Seguranca-Alimentar	The Provincial Directorate of Agriculture and Food Security (DPASA) is the organ of the Provincial Government, responsible for the direction, planning, coordination, technical control and execution of all agrarian activity in the domains of Agriculture, Livestock, Agricultural Hydraulics, Forestry and Food Security
DPIC – Direcção Provincial da Indústria e comércio	Gov	www.pmaputo.gov.mz/por/Informacao/Informacoes-por-Sector/Direccao-Provincial-da-Industria-e-Comercio	The Provincial Directorate for Industry and Commerce is the provincial organ of the State apparatus, which in accordance with the principles, objectives, and tasks defined by the Government, directs and ensures the execution of the activities of Industry and Commerce at the provincial level.
IIAM – Centro Zonal Centro	Gov	www.iiam.gov.mz/	Research and dissemination of agriculture techonologies,
IAM – Instituto Agrario de Chimoio	Educational Institute	lourenzodomingos@teledata.mz	Institution dedicated to the training of agricultural technicians. In the specialties: agriculture, livestock, Forests, Wildlife
ISPM – Instituto Superior Politecnico De Manica	academy	www.ispm.ac.mz/index.php/pt/	Research and dissemination of agriculture techonologies,
Companhia de Zembe	Business	www.cnfapr.medium.com/mozambican-seed-producer-plants-seeds-for-success-d1987abda110	Zembe's company (companhia do Zembe) is a company dedicated to the production and commercialization of seed
IAV-Insumos Agrícolas e Veterinários	Business		IAV is a company that sells fertilizers grain and legume seeds.
Agri-Focus	Business		
Casa do agricultor	Business	http://www.tecap.co.mz/	Specialized in selling of agricultural inputs
Instituto Médio Técnico Profissional Njerenje	Educational institute	http://centronjerenjemozambique.blogspot.com/p/at-njerenje-school.html	Educational center with agricultural and farm components

Department or organization	Sector	Website	Description
Mozambique ferlizer Company	Business		Supply farmers, both on a commercial and small scale, with technical advice soil fertilizers
ADEM-Agência de Desenvolvimento Económico de Manica	Government	https://www.devex.com/organizations/adem-agencia-de-desenvolvimento-economico-da-provincia-de-manica-111256	ADEM, Manica Province Economic Development founded in November of the year 2000 Agency is one of the first successful agencies constituted to promote and implement the LED strategy in the province
Luteari – Insumos e Serviços Agricolas	Business	http://www.luteari.com/	Work with small farmers supllies agricultutural products, extension services.
ETG-Export Trading Group	Business		Seeds supply
Agência de Desenvolvimento do Vale do Zambeze	Other	https://www.agenciadozambeze.gov.mz/contactos/	Conducts development studies, designs strategies, provides technical and financial assistance in the Zambezi Valley region
IDE-International Development Enterprises	Business	https://www.ideglobal.org/country/mozambique	Is an American non-profit NGO that promotes sustainable income growth for smallholders by developing and promoting appropriate low-cost technologies designed for smallholders.
Fundacao Micaia	CSO	https://micaia.org/	Is a Mozambican non-profit organisation (NGO) that works mostly in Manica Province. Their support to communities includes training farmers and supporting their organisations for example, helps them get a better price for their crops.
Eco Micaia	Business	https://micaia.org/	Eco-Micaia Ltd is a social enterprise, registered in 2007, developing and managing inclusive business subsidiaries and establishing new value chains that create fair market access for suppliers and producers.
SEEDCO	Business	https://www.seedcogroup.com/about-us/overview	Seed Co is the leading certified seed company authorized to market seed varieties developed by itself, government and other associated seed breeders in over fifteen (15) African countries. We have maintained a strong market share among communal and commercial farmers from years of intensive investment in Research & Development.
Land O' Lakes	Non-profit	https://www.linkedin.com/jobs/view/chief-of-party-mozambique-at-land-o-lakes-inc-167459999/?originalSubdomain=mz	Land O'Lakes International Development is a 501c3 nonprofit organization whose vision is to be a global leader in transforming lives by engaging in agriculture and enterprise partnerships that replace poverty with prosperity, and dependency with self-reliance

4.4. Household survey

A household survey was conducted amongst community members in both districts, comprising interviews with male and female members of the cooperatives and associations that the SUSTAIN Mozambique team will be working with.

The sample was selected by firstly dividing the sample across the two Districts chosen by SUSTAIN Mozambique for inclusion, and then the cooperatives and associations located in the Districts were listed out. Some of these were randomly selected, as shown in the table below, and then a random walk was conducted to select households, who were then checked to ensure they were members of the relevant association or cooperative, and then the leading adult male or female in the household was interviewed. The following are the intervention areas provided to Ipsos by SUSTAIN, and the number of household survey interviews conducted in each area (table 2).

Table 2. SUSTAIN PRO Mozambique intervention areas and sample achieved

District	Localitiy	Community	Farmer Association / Cooperative	Sample achieved
Barue	Nhazonia	Nhazonia	Psicultores de Nhamuzarara	29
			Associação Vida Nova	2
		Chindengue	Cooperativa Samora Machel	29
Vanduzi	Belas	Belas	Associação 07 de Abril 1	12
			Associação 7 de Abril 2	11
			Associação Munharare	14
			Associação Campo 4	10
			Associação Nhaumbwe	12
			Associação Nhamudururo	11
	Moniquera	Moniquera	Associação Futuro melhor	17
			Associação Limbicane necurima	12
			Associação Juntos venceremos a fome	21

Source: SUSTAIN Mozambique team

Twenty-six enumerators were trained and employed for this study. They were trained from 9th to 11th September with the participation of a representative from the SUSTAIN team present, and fieldwork took place between 15th and 23rd September.

Computer assisted personal interviewing was used to collect data, using the i-Field platform, and various management and quality control methodologies were put in place to ensure that a high quality of data was collected, for example:

- GPS mapping to ensure interviews were conducted in the intended areas of enumeration.
- Silent audio recording to selected questions to confirm the questions were properly administered and answered.
- In field accompaniment by the supervisor to ensure all methodologies for this survey were followed. For example, the household selection method through following the left-hand rule, introduction and consent taking.
- Data check, a team of well experienced QC executives reviewed the coming data from field on the daily basis to pick out any interview that showed any discrepancy or logic error. This allowed the field team to re-do their work on time if there has been any problem on the data.
- Call backs, respondents were contacted by in-office QC team to confirm if they've participated in the survey but also to rectify their answers in case there was a logic error in their interview data.

4.5. Focus group discussions

Focus group discussions were conducted in both Districts, namely 2 focus groups in Barue, in Vila de Barue, 2 focus groups in Moniquera in Chimoio and 1 focus group in Belas, in Vanduzi.

A total of 5 focus group discussions were conducted where two were comprised of only men, two comprised of only women, and one of mixed genders. A team of two experienced and trained moderators conduced the FGDs across the Districts. Recruited participants for the FGDs were all farmers.

4.6. Limitations

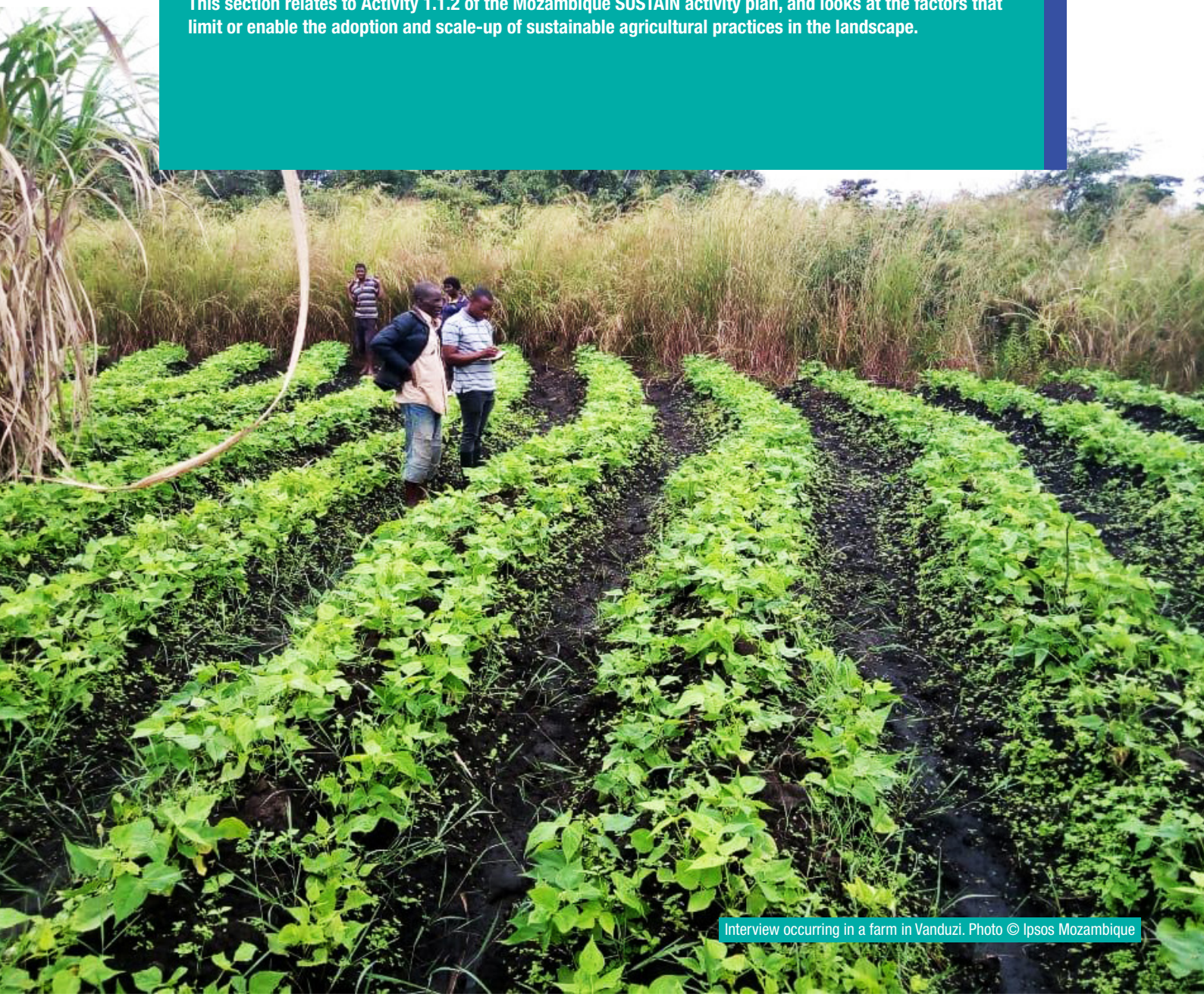
The following are the key limitations of the baseline study:-

- One of the baseline's limitations is a lack of information down to the level of the landscape based on secondary sources. Whilst there was more information available for Manica Province, generally there is a lack of information for certain topics of interest to us. This means that baseline information across a range of factors is not available.
- Similarly key informants did not have information on a range of topics.
- A number of indicator areas should have been tackled using specific surveys of target groups / observations and process reviews, but these were not within the scope of the baseline study.
- Household survey sample size is 180 in total, split between Vanduzi and Barue. At the total sample level, this implies a margin of error on results of +/- 7.3 at worst case, and 95% confidence, when looking at findings for Vanduzi and Barue separately, the margin of error will be greater than this.
- Only 4 focus group discussions were conducted in the landscape.

5. FACTORS THAT LIMIT OR ENABLE ADOPTION OF AGRICULTURAL PRACTICES

5

This section relates to Activity 1.1.2 of the Mozambique SUSTAIN activity plan, and looks at the factors that limit or enable the adoption and scale-up of sustainable agricultural practices in the landscape.



Interview occurring in a farm in Vanduzi. Photo © Ipsos Mozambique

All data mentioned can be found in the Chapter 5 Tables subsection of the Appendices. Each section title links to the appropriate section in the appendex.

5.1. Background on farms and challenges to farming in the landscape

5.1.1. Crops and animals farmed

Households in Barue commonly farm maize (95%) followed by soya-bean (47%), whilst in Vanduzi, a wider range of crops are grown. Key ones are maize (90%), local green vegetables for home consumption (35%), green vegetables for sale (29%), tree fruits such as mango, avocado and the like (31%), sweet potato (28%) and cassava (28%). Beans are cultivated by under a third of households overall, and more in Barue than Vanduzi.

5.1.2. Challenges and barriers to increased production and sales

The main challenges faced by farmers can indicate a key entry point for SUSTAIN PRO, since addressing these issues would be highly welcomed by farmers in the landscape, so provide a way of promoting for sustainable solutions.

Thus farmers were asked to name their main challenges, without being prompted with a list of problems from the enumerator. In Vanduzi, the lack or high price of inputs (pesticides, fertilizer, seeds) is the leading challenge faced (by 56%), followed by pests (44%). In Barue, pests is the leading problem (37%), followed by lack of water (rain, wells etc) (24%) and drought (20%) the next most significant challenge was stated as lack of irrigation sources, followed by drought. Barue households also mentioned weed problems, and financial issues more than in Vanduzi.

A list of potential problems was read to respondents, and asked if they were a problem at all, and if so whether that was a big, or small problem. Results are below, in Figure 2. From the list of items, the high price, and lack of affordability of inputs was most prevalent (said to be a big problem by 61%). This is in line with the spontaneous replies that respondents in Vanduzi gave above. One of our key informants from a member of Nhongue Association, from Vanduzi agreed with this point:

"Vegetables demand a lot of expenses in production and in recent years, in terms of inputs they are more expensive". (Male, Vanduzi)

Food prices may be affected by the war in Ukraine since the high cost of food was the next most widely mentioned item (58% said it was a big problem). This is followed by crop pests, insects and diseases (52%), then not being able to access finance for farming (48%), and then drought (46%). In terms of soil fertility, 38% mention reduction in soil fertility as a problem. The key informant at the SDAE District service of economic activities, reflected on this issue:

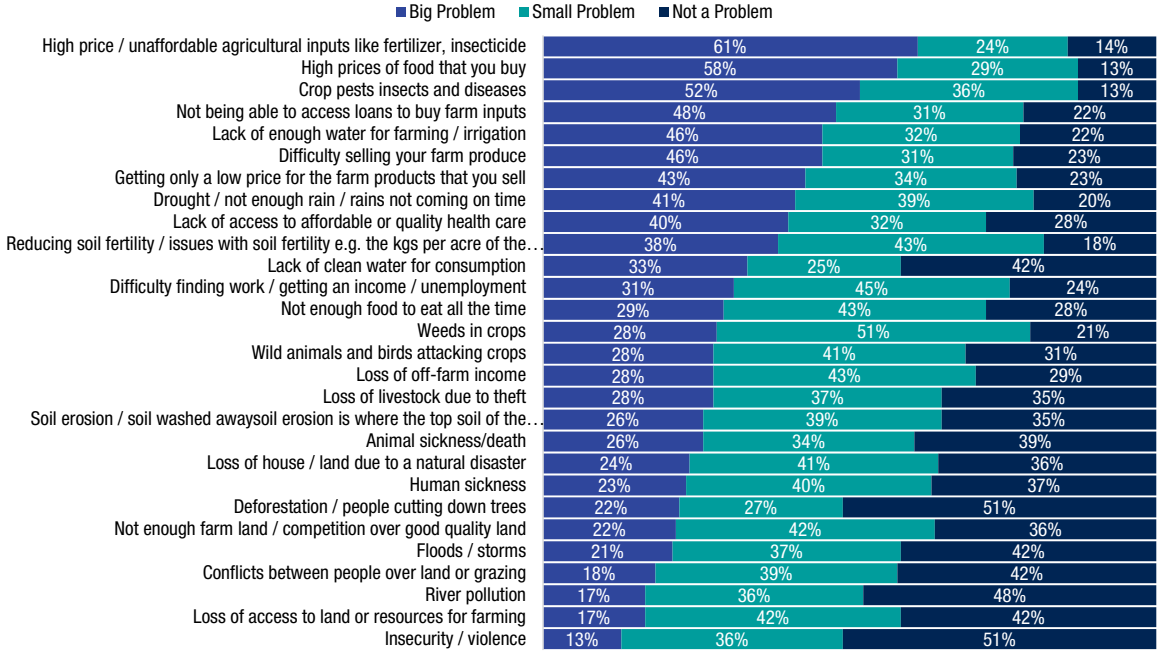
"The very infertility of the soils. Our soils are poor since colonial times these soils have been used using fertilizers, now our producer is not able to obtain these fertilizers, he does not have the power to buy these fertilizers and then in these last days, greater frequency of pests." (Male)

As one man from Moniquera focus group put it bluntly when asked

"And why not put fertilizer?...Because I don't have the funds to buy fertilizers." (Male, Moniquera focus group).

Figure 2. Problems experienced (prompted)

I am going to reading problems and challenges that some farms and households experience and others do not, for each one I would like to know if it's a problem to your household or not, and if it's a problem is it a big or small problem



The big problems that households complain about are important entry points for the SUSTAIN PRO team, as citizens in the landscape will be very amenable to proposed solutions to these problems. The top challenges in Vanduzi are the affordability of agricultural inputs (56% mentioned this spontaneously), and dealing with crop pests (44%), whilst in Barue the key problems are pests (37%) and drought / lack of water (24%).

On being read a list of challenges, these also came out as the most important ones, though the high price of food to eat was also mentioned. The SUSTAIN PRO team can explore how these problems can be tackled through nature based and sustainable solutions.

Agricultural finance is another area of potential intervention, as this was the fourth-most issue mentioned, through partnerships with providers and via the Associations and Cooperatives, and issues relating to the marketing or selling price of the farm produce. Soil fertility is also recognized as a problem but would probably be taken more seriously if farmers link that up with the idea of reducing the cost of inputs by these farmers.

5.2. Soil fertility

5.2.1. Background on soil fertility and what is done to address it

The household questionnaire focused in-depth on some of the key problems areas in farming, to understand how these are being addressed and what we can learn from that in terms of whether farmers are already using sustainable practices, and the kinds of practices they are already doing.

Soil fertility is clearly a big issue to farmers. Even though it was not the most commonly mentioned "big" problem, above, a large majority of respondents already do something to preserve or enhance soil fertility (79%), and that is the case across both Districts within the landscape.

Respondents were asked to say, without being prompted with a list of items, what they do to preserve or enhance soil fertility. The most common practice mentioned, by a quarter of respondents in both Barue and Vanduzi, is to use fertilizers, like "urea", "Npk", "fungus" and so on. Almost on a level with that is adding compost (22%) and then manure (20%) are the next most common practices, more so in Barue than in Vanduzi. A smaller proportion mention not burning the soil. Very few spontaneously mention crop rotation, reducing tillage, and growing legumes.

Men are much more likely than women to mention compost, whilst women are more likely to mention use of fertilizers. This could be because of lower awareness of composting amongst women compared with men.

All respondents were then read a list of possible actions to enhance or preserve soil and asked if they do them. Overall, a much large range of items were mentioned, and this could indicate that some respondents then "overclaimed" their activities or that these activities are done but not linked to soil health. Crop rotation was the most widely mentioned practice (69%), conducted more in Barue than Vanduzi, and more often mentioned amongst men than women. This was followed by planting legumes (65%), adding manure (52%), adding chemical fertilizer (50%) and compost (41%).

It is interesting that even after prompting, only half say they put manure on their farms, and not all farmers add compost.

5.2.2. Barriers to and facilitators of adoption of ways of preserving or enhancing soil fertility

In this section we cover the reasons why farmers have or have not adopted ways of preserving or enhancing soil fertility.

As noted above, after prompting almost all households claim to do something to enhance or preserve soil fertility, thus overall there is no information as to why nothing is done overall, since the sample size was very small.

The main reason why some households do not use manure, is because they do not have it available (39%), or they have it available but did not know it is helpful to soil fertility (32%).

Eight percent of respondents said they feel it is unhealthy to use it / poisons ground or is harmful in other ways. This is reflected by the delegate from Manica who said,

"There is a myth that circulates that when I use manure the land will rot, it is a challenge to use fertilizers, organic material to replace the nutrients in the soil". (Male, Manica)

No particular reason was mentioned by a few respondents, indicating that they are probably doing things by habit.

For those not using compost, the primary reason is that they do not know how to make compost, especially in Vanduzi and amongst male householders, followed by being able to make it but not knowing it is helpful (i.e. lack of information). This was more widely mentioned by females than males. A tenth of respondents in Barue said they do not have available plant matter, perhaps indicating the dry nature of the terrain in Barue.

The main reason for not using compost is not knowing how to make it. This presents an opportunity for SUSTAIN PRO to work with partners to improve knowledge in this area.

Whilst as noted above, most farmers claim to rotate their crops (69%), the main reason for not doing so is a lack of knowledge (47%), followed by not having a large enough farm to do so (18%).

The main barrier to planting legumes in Vanduzi is that they do not know how to do it (40%). In Barue the main reason is that they did not know that planting legumes is helpful to soil fertility (40%).

Those who do not reduce tillage in Barue say that they have no particular reason for not doing it or that they don't do that because of habit or tradition (51%), whilst in Vanduzi they say they continue digging to make planting easier (31%), to get rid of weeds (25%), followed by no particular reason (24%), and that they did not know it was beneficial or consider it harmful. Quite a number did not know that it is helpful or thought it would be harmful. These are some of the attitudes that would have to be overcome to persuade farmers to reduce tillage.

Intercropping is not done primarily because respondents did not know that it is beneficial (23%), they do not know how to do it or which crops to mix (22%), or that they just do not like mixing crops in the same space (19%).

For a range of the techniques for improving soil fertility, the key barrier to adopting them is not knowing how to do it (for planting legumes, rotating crops, and intercropping this was one of the top two reasons). Not knowing it is helpful was also a key limitation, especially for inter-cropping, planting legumes, rotating crops, using compost and manure.

The other key barrier is habit, for example for reducing tillage the main reason for not doing it is just habit, followed by that it makes planting easier and gets rid of weeds. For manure, the key reason is not having any manure available, and the same is true to some extent for compost – some farmers do not have any available plant matter.

The key intervention points are around training or demonstrating to farmers how to do these techniques, and ensuring they understand the benefit of them. For manure, there is a need to encourage mixed farming and / or understand how manure can be provided.

5.3. Control of pests and diseases

5.3.1. Background on pests and diseases and what is done to address them

As for improving soil fertility, a majority of households do something to try control pests and diseases on their farm. This is not surprising given it is the biggest challenge the household spontaneously brought up.

Farmers in Vanduzi are more likely to say they do something than those in Barue, likely because more farmers in Vanduzi reported pests as a more significant problem than those in Barue.

Respondents gave the ways in which they control pests or diseases, and the only significant action mentioned spontaneously is spraying with chemical or home-made pesticides. Men are more likely to say they do that than women. Like many other preventive measures discussed here, cost it a factor.

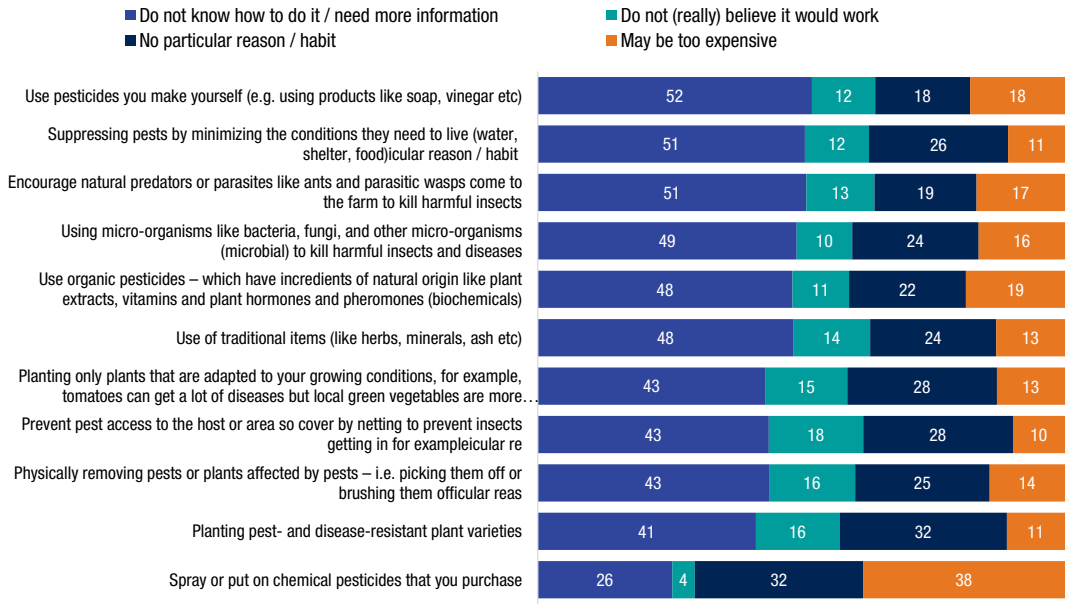
Respondents were then prompted with a list of things that could be done to control pest and disease. Again, the most common method mentioned is spraying on chemical pesticides (74%). This is followed at a distance by physically removing pests, especially practiced in Barue, and then use of traditional items like herbs, minerals, ash and the like. Planting of pest and disease resistant varieties is also mentioned, especially in Vanduzi. A wide range of more sustainable practices were mentioned by less than 20% of respondents.

Whilst very few people do nothing about pests and diseases, for those who did do nothing, the main reason is lack of money. As a woman interviewed in Barue focus group said,

"the problem is price before last year it's 1880-2000 meticais [$28-$31 USD] but at the moment it's 2500-2900 meticais [$39-$45] so I have children at home who go to school and … so to do everything at once is difficult". [Women, Barue]

The chart below (figure 3) shows the main reason why all of these different ways of controlling pests and diseases is not done, and the main reason is that they do not have enough knowledge on it. There is a need to sensitize farmers to these methods as appropriate.

Figure 3. Why did not use these methods of controlling pests and diseases



A majority of households report taking actions to address pests and diseases on their farms, with spraying chemical or home-made pesticides as the top method (74%). Those that did not engage in these activities reported lack of knowledge (52%) on making home-made pesticides, and expense (38%) of store-bought pesticides. This knowledge gap presents a key entry point for SUSTAIN PRO, as training on home-made pesticides would ameliorate the knowledge gap and cost in one.

5.4. Weed control

Most respondents in both Districts and both women and men say they do something to control weeds. Mostly they weed by hand (76%).

On prompting with a list of weed control actions, again, weeding by hand, mower or machine was the most common mentioned (67%), followed by clearing weeds around the edges of the farm plot (40%), followed by using natural products (22%). Whilst the example given in this category in the questionnaire is corn gluten meal it is unlikely this is available to famers in the landscape, so they were probably using other natural products. This is followed by using packaged chemical herbicides (used by 18% and 23% respectively in Barue and Vanduzi), and mulching, especially in Vanduzi (23%).

5.5. Soil erosion

Soil on plots is described as sandy or clay, across both Barue and Vanduzi, though a significant minority did not know how to describe their soil-type. This data is available in the appendix. Amongst those with soil erosion issues, who are about 65% of farmers, 56% feel that soil erosion is reducing the productivity of their farm, with similar responses across the two Districts and amongst female and male householders. This is equivalent to 36% of all farmers surveyed. The main cause of soil erosion is rain washing soil off, floods and overspill from rivers and dams. A significant proportion of households with soil erosion, 28%, say they do not know what causes it.

Just under half of farmers (48%), significantly higher in Vanduzi (53%) than in Barue (37%), say they do something to control soil erosion. Men seem better informed in this regard than women (57% compared with 39%). Among those who do something to control soil erosion, the most common practice mentioned spontaneously is to build a wall, a stone perimeter or digging a ditch (43%) followed by creating a barrier with dunes or sandbags (20%), followed by planting trees / having trees to act as a wind break (14%), and having a grass strip to contain soil.

All respondents were asked if they do any of a list of things to control soil erosion, or if any methods of controlling erosion are present on their farm. Just over a third said that nothing is done / nothing is present. The most common practices were said to be planting a grass belt to contain soil and planting, building a wall or ditch, half-moons to retain soil and water, reducing access by animals and humans and planting trees to reduce wind.

5.5.1. Barriers to controlling soil erosion

The most common reason for doing nothing to control soil erosion is that they do not know how to do it or need more information (35%). Another group said that the rain is not enough to cause erosion (21%), it is too expensive (12%) or they had never thought of doing anything about it (11%).

65% of households report soil erosion issues, though only 48% of farmers report doing something to control soil erosion. There is a significant gender gap (57% men v. 39% women) regarding knowledge about soil erosion and how to address it, presenting a key entry point for SUSTAIN PRO to increase knowledge amongst women farmers about soil erosion and amelioration techniques.

5.6. Irrigation and rainwater catchment

5.6.1. Water sources

Water for consumption is obtained from a river (34%) or from a well (25%) or a spring (19%). Just over a tenth (12%) get water from mains, or from a dam (11%).

The most common water for farming in Barue is rainwater, relied on by 57%, followed by river water (33%), while the most common source in Vanduzi is river water (35%) alongside rain (28%) and spring water (25%). Female respondents are more likely to say that their household relies on rain water for farming than male respondents.

5.6.2. Barriers to rainwater capture

As table 26 below, shows. Those households that do not capture rainwater are prevented by not knowing how to do it (32%), not having enough rain (19%), that it is too expensive (11%) and habit / not having thought about it (10%).

5.6.3. Irrigation

Seventy-nine percent of farmers do irrigate or water their crops at some point, at a similar level across the districts and genders.

Just under a third use a sprinkler or pipe (31%), and ditches to direct water from the water source (30%), and 24% carry water by hand or use a hose pipe.

Most farmers surveyed (69%) say they are very reliant on using irrigation to produce adequate income from their farm. Only 27% say they are only a little or not at all reliant on irrigation. Thus irrigation is a widespread practice in the landscapes.

Those who do not irrigate say rainfall is enough (47%), they do not have a source of water near to them (35%) or they do not have a pump-to-pump water where they need it (12%).

Rainwater is not enough to water crops in the landscape. This is supported by the fact that very many respondents say that irrigation would be very beneficial to them assuming they could do it (77%).

Barue farmers rely on rainwater for their crops (57%), while Vanduzi farmers are more varied, between river water (35%), rainwater (28%), and spring water (25%), which indicates a need for different interventions in the districts. Across the landscape and genders, 79% of farmers report irrigating or watering their crops, with 69% reporting high reliance on irrigation to produce adequate income for their farms. This should be a key intervention point for SUSTAIN PRO.

5.7. Extension services

5.7.1. Types of extension services available in Mozambique

Public extension services were created in March 1987 when the Government shifted from priority support for state farms in terms of public investment, to address more attention for the small scale farmers. Private extension started mainly in the early 1990s following the privatization of large state farms, particularly in the northern region (Niassa, Cabo Delgado and Nampula provinces) and to some extent in the central region (Zambézia, Manica and later in Tete province). Although a few NGOs had started providing extension services in the early 1990s, NGOs extension grew largely after the Peace Accord in October 1992 which ended a 16-year-old war, when most of them shifted from emergency activities to agriculture and rural development related efforts. Thus, Mozambique has had a pluralistic extension system since the early 1990s (Gêmo et al., 2005).

The role of extension in contributing to improved agriculture performance is well known, particularly in technology transfer, farmers' organizations support, facilitating of market linkages and natural resources management (Hanyani-Mlambo, 2002).

In Mozambique extension is particularly important because:

- Agricultural productivity is still generally very low
- Farmers organizations and other agriculture related community-based organizations are still largely underdeveloped
- Agriculture is largely dominated by small scale farms and some medium scale farms that account for 99.3% of the total farms (INE/CAP, 2010), most of them facing a plethora of farming and market related constraints
- Agricultural potential for crop production, livestock and inland fisheries/aquaculture is high to moderate in considerable parts of the ten agro-ecological regions
- Agriculture is the main source of livelihoods for rural people and to some extent for some peri-urban people – therefore crucial in boosting food security and contributing to improved welfare of particularly poor people.

5.7.2. Agricultural extension service providers

For farmers various communication channels exist, of which public extension services is just one source of information, often purely focusing on production issues (Spielman, Kolady, Cavalieri & Chandrasekhara 2011) Currently three categories of agricultural advisory providers provide agricultural extension services namely public, private and non-governmental organizations (NGOs)

- The "national public extension" or generally referred to as public extension has been using mainly the Training and Visit (T&V model) since 1987, and the Farmer Field School (FFS model), since the late 1990s. Eicher (2007) noted that there is a spirited debate among extension specialists whether the FFS is an approach or a model. In Mozambique the "National Public Extension model" has been referred to as the "public extension (services)" while the T&V and FFS approaches have been generally considered as metodologias de extensão (extension methodologies).
- The NGO extension model, comprising different types of organizations. Several NGOs have redefined their coverage at provincial and district level, while others have also redirected their intervention focus towards, for example, specialized advocacy on market related issues, HIV/AIDS issues, women empowerment, rather than holistic extension activities, which happened with some international NGOs after the 1993- 1998 agricultural revival period (Gêmo et al.; 2005).
- Private extension model which has basically been used for cotton and tobacco and some emerging crops such as sesame and soybean throughout-growers' schemes.[3]

Agricultural education institutions are also potential advisory services providers. However, the role of universities and other agricultural degree education institutions in providing extension services has been limited, including through collaborative activities with MINAG, or with NGOs and private providers. Budget constraints as well as limited quantity and quality of full-time lecturers in existing agronomy and veterinary faculties have been constraining the role of these institutions, particularly in contributing to extension (Gêmo, 2006).

5.7.3. Sources of information to farmers

To understand how best to provide information about promoted solutions to farmers, the household survey explored where farmers currently get their information from.

A large majority of farmers (89%), across both Districts and genders, reported needing information and training to run their farm. Nearly two-thirds of respondents across both Barue and Vanduzi, and amongst women and men, had received information, training or help on farming in the previous 12 months. Thus it seems that women are as likely as men to have received information.

Ministry of agriculture extension officers seem to be present in the landscape in that 41%, more so in Barue (53%) than Vanduzi (35%), said they got their advice from that person. This may indicate that agricultural extension officers are less widespread in Vanduzi than Barue, or at least for the sampling points randomly chosen.

3 Searching for more up to date sources

The next most common source is from a group or association of farmers (24%), which is not surprising since all respondents are members of a producer group, and this is particularly the case in Barue (42%), more than in Vanduzi (16%). Women are at least as likely as men to receive information from producer groups. The fact that they are members must provide them with access to information from this source. Generally, however, the associations and cooperatives that they are members of are not a primary source of information to these farmers, which provides an entry point for the SUSTAIN PRO program.

Village or community meetings were also mentioned as an information source, and men were more likely than women to get information from community meetings. This may be limiting women's access to information.

In terms of the type of information received, the main information received was on farming methods (68%), followed by seeds (40%) and fertilizer (34%).

Amongst those who had received farming help and information, only 22% are very satisfied with the **amount or frequency** of farming help and information they receive. This is a very low level of satisfaction. Men seem more satisfied than women (29% and 16% respectively), indicating a gap for women in the adequacy of the amount of information they receive. Whilst the proportion of farmers who are very satisfied are similar in Barue and Vanduzi, at the other end of the scale, farmers in Barue are more likely to say they are very dissatisfied than those in Vanduzi. A male respondent from the Moniquera focus group said:

"**We have land, we have soil, without knowing exactly what to produce in this soil. This is another problem that the small scale farmer is facing The small scale farmer only produces for the sake of producing without knowing what to produce what". [Male, Moniquera]**

There are similar levels of satisfaction with the **quality of help and information received**, with again men being more satisfied than women, and with similarly high dissatisfaction in Barue.

Most respondents (94%) believe that men and women have equal access to farm information, training and help. This is reflected in the focus group interviews. The very few respondents who feel that women have less access than men mentioned that it is because they have other activities such as taking care of their home, or that women are not able to perform certain activities such as tree felling.

A very large majority of farmers (89%) say that they need information or training to run their farms, yet only two-thirds had received any information in the past 12 months. According to this measure, women were as likely to have received information as men. Ministry of agriculture officers are the main source of information amongst 53% in Barue and 35% in Vanduzi, and so do appear to be somewhat active in the landscape. Far behind as an information source are farmers groups, associations and cooperatives, meaning there could be an opportunity to strengthen these vehicles for information provision. Women were as likely as men to receive information from this source. Men are more likely than women to get information from village meetings.

Generally there is a very low level of satisfaction with the amount and quality of extension information received across both Districts and amongst male and female farmers, though men are slightly more satisfied than women.

There is a strong need for agricultural advice, information and training in the landscape, which is not adequately met currently. Government extension workers and farmers groups Can be worked with to strengthen the advice they are providing.

5.8. Finance for agriculture

Even though, as we have seen, farmers face problems with the affordability of inputs, there seems to be low levels of finance available in the landscape. There is extremely low awareness of organizations that provide loans to farmers in the landscape. Only 13% of respondents overall say they know of one, and women are less likely to be aware of one than men (9% and 18% respectively). This may indicate that institutions are engaging more with men than women in the landscape. The organizations known amongst the few who were aware of one were farmers' groups, cooperatives or associations, village savings and loans societies and micro-finance organizations.

Despite the low level awareness of institutions, around half of farmers feel it is very likely that they would be given a loan should they need one. This may be due to a lack of awareness of how difficult it is to get a loan. Barue farmers are more positive about this than those in Vanduzi, and men are more positive than women.

Respondents perceive that the main reason they do not get loans for farming is that they are not trusted by financial institutions due to their low education (31%), that is especially of concern amongst farmers in Vanduzi (38%) compared with Barue (15%). This is followed by a lack of collateral (19%), mentioned especially by Barue farmers and of course a lack of financial institutions to provide a loan (14%). Both male and female respondents report similar barriers to receiving loans for farming.

Nearly half of respondents have their own personal mobile money connection, though this is very male biased with 71% of men compared with 21% of women having it. This could thus be used as part of financial services, but only for men. Women would be excluded from financial products administered via mobile money.

Even though, as we have seen, farmers face problems with the affordability of inputs, they are not widely aware of any institutions providing loans in the landscape. Not only are few institutions available in the landscape, there is extremely low awareness of organizations that provide loans to farmers in the landscape – only 13% say they know of one, and women are less likely to be aware than men. This may indicate that institutions are engaging more with men than women in the landscape. The organizations known were farmers' groups, cooperatives or associations, village savings and loans societies and micro-finance organizations. Farmers are optimistic that they are very likely to be given a loan should they need one. This may be due to a lack of awareness of how difficult it is to get a loan or for the organizations they mentioned, receiving a loan, albeit small, is relatively easy.

Respondents perceive that the main reason they do not get loans for farming is that they are not trusted by financial institutions due to their low education (31%), that is especially of concern amongst farmers in Vanduzi (38%) compared with Barue (15%), lack collateral (19%), and of course a lack of financial institutions to provide a loan (14%). Nearly half of respondents have their own personal mobile money connection, though this is very male biased with 71% of men compared with 21% of women having it. This could thus be used as part of financial services, but only for men. Women would be excluded from financial products administered via mobile money.

From the fact that very few respondents in the survey could mention a financial institution, we can deduce that there is a need for more organizations offering loans to farmers, including female farmers, in the landscape.

For more information, see Appendix.

6. LAND ACCESS AND RIGHTS AMONGST MEN AND WOMEN

In this section we explore the current situation with regards to land access and rights amongst men and women. This relates to "Activity 1.2.2 Help secure equitable land tenure and other user rights for women and men".

Some of the participants of Vanduzi focus group. Photo © Ipsos Mozambique

All data mentioned can be found in the Chapter 6 Tables subsection of the Appendices.

6.1. Land legislation and policies in place

6.1.1. The new land legislation

After the first multi-party elections in 1994 and Frelimo's victory, the government's Five-Year Plan (1995-1999) included land legislation. The Ministerial Council approved the National Land Policy and an implementation strategy in 1995 (Republic Bulletin, 28,02,1996). The principles and goals that were to guide the National Land Policy are based on the following declaration in its 18th point: "To guarantee the rights of the Mozambican people to land and other natural resources, as well as to promote the investment in and sustainable and equitable use of these resources". The new Land Law (Law 19/97) was passed by Parliament in July 1997. By the end of 1999, the legal instruments required to implement it were passed, namely, the Land Law Regulations for rural areas and the Technical Annexe containing rules on the delimitation of community lands and the rules governing fees payable by land users.

In the Republic of Mozambique, land is the property of the State. This means that the right of ownership over land is vested in the State (article 46 of the Constitution and article 3 of the Land Law)(Government of Mozambique, 1997) and cannot be sold, alienated or mortgaged. However, all Mozambicans have the right to use and enjoy the land (right of land use and benefit).

6.1.2. Who can hold a right of land use and benefit?

Two main categories of land are prevalent in Mozambique:

a. Public lands (state and municipalities): The Constitution determines which lands are held under state public domain, and over which no DUATs can be issued. Parties interested in occupying public land may apply for a special license.

b. Community lands: Most rural land is held by communities, who have perpetual DUATs based on their traditional occupancy. Delimitation and registration of this land is voluntary as communities are not required to delimit or register their land to assert their DUAT (LANDac 2016).

The following can be holders of a right of land use and benefit:-

- Individuals
- Corporates
- Local communities

There are national and foreign title holders. National titleholders- National individual and corporate persons, men and women, as well as local communities may be holders of the right of land use and benefit.

6.1.3. The DUAT

Rights to access and use land are officially recognized by the possession of a DUAT (**Direito de Uso e Aproveitamento da Terra** or "right to use and exploit land"), that women and men can obtain. The DUAT can be issued in three ways.

- First, communities can obtain a perpetual DUAT for land recognized under customary systems. As such, communities are the holder of a single state DUAT, which recognizes that the customary norms and practices also determine individual and family land rights within the community.
- Second, individuals occupying land in "good faith" for at least 10 years have a perpetual DUAT for residential and family use.

In these two forms, communities, and individuals can prove land rights through testimony without registration or titling, i.e., they are not required to hold a formal DUAT title to prove their land rights (Cabral and Norfolk, 2016).

- Third, individuals can apply for a DUAT for up to 50 years (with one renewal) and a land rights concession, typically for natural resource extraction or developing agricultural, forestry, or fishing activities (Åkesson et al., 2009; Cabral and Norfolk, 2016). While community members can obtain a DUAT by occupying land for 10 years, individuals requiring land for non-housing or non-community purposes must apply for a DUAT title (Hilhorst and Porchet, 2012).

Occupancy-based DUATs can be registered with the National Directorate for Lands (DINAT) of MITADER to give notice and formal documentation of rights, but do not need to be registered for the holder to assert and defend the use-rights to occupied land (Norfolk and Tanner 2007; GOM Land Law 1997; GOM Land Regulations 1998).

DUATs obtained by customary and good faith occupation are perpetual and do not require plans for exploitation (use) of the land. However, if communities want to formally register their DUAT, they must prepare an exploitation plan. Members of local communities can obtain DUATs for individual plots within the community land, but have to go through a process of consultation with their local leaders.

The large areas of land that fall within the remit of local community DUATs, but which are not covered by individual customarily acquired DUATs are classified as community public domain.

This means that the respective local community has land and natural resource management powers devolved to it by the State.

6.1.4. Land law legislation and whether it legislates for the inclusion of women

Mozambique's legal framework should ensure equal rights for women and men related to land. This flows from the principle of equality provided for in articles 66 and 67 of the Constitution of the Republic. In the law, by making the right of individual persons (men and women) explicit and clear, the legislator wished to stress that the right can be held by women independently of male guardianship. The Land Law of 1997 officially recognizes women as co-title holders of community-held land and further states that all community members (and therefore also women) should participate in decision-making processes. In addition, the law prescribes processes of participation in regard to the identification of community land boundaries (Knox and Tanner 2011). The law provides women with the opportunity to announce their interest in land and to adopt leadership roles.

6.2. Perspectives on the new land law

When asked about the new land law, most stakeholders interviewed as key informants, felt positive about the law, saying it

"It gives access…to all Mozambicans",

and

"Women also have the right to use the land and in the community a person even without a Duat for himself has the right to use the land as usual".

However, several interviewees had pointed criticisms of the law, most of which fall into a single category: lack of public knowledge.

Thus the text of law itself received strong approval, but when it came to application many felt hesitant.

"I think that if the law were followed in its entirety, the impact would be very positive at the community level. People have very little knowledge of what the Land Law is, there is a lot of work to be done for this law to have a very positive impact within communities."

As one interview put it,

"Once you introduce a law, you have to look for ways to spread it, for everybody to have access to the law, everybody to have access to information about the law".

This sentiment was echoed in several interviews, particularly when considering its impact on women. As a respondent in the District Service of Economic Activities said,

"The law is clear, that everyone has the right, but that prejudice still persists…so they always think the land belongs to the husband, but the law here is clear that everyone has the right".

6.3. Concerns

A concern is that since 2020 the 1997 Land Law and other laws governing land are being revised to encourage investments (in 2020 the public hearing phase of the National Land Policy Review took place, being undertaken by the National Land Policy Review Commission or Comissão de Revisão da Politica Nacional de Terras). This is said to be done to address "rigid policies and laws" that have hindered agricultural investment in the country. This has led to concerns that this might negate the power of communities, and particularly women. At present, Mozambique's Land Law empowers local people to participate in the management of land and other natural resources, including the allocation of rights to investors, and in conflict resolution. Private investors seeking new DUATs must consult local communities first and local people can choose to say no to land concessions and keep their rights, or agree to terms with investors(Ntauazi et. al. 2021).

6.3.1. Implementation of the law

This legal framework recognizes traditional community rights while encouraging investment. While the resulting legislation is progressive – land is owned by the state, and communities and good faith occupants have perpetual use rights – as we shall see below, it is not strongly implemented (USAID 2021).

The main problem with land law in Mozambique is that it has been poorly or unevenly implemented. In theory, the law provides communities and individuals with strong tenure but large numbers of rural residents lack the capacity to secure these rights in practice. This continues even despite significant projects and programs implemented by the government and non-governmental organizations to raise awareness of rights.

The key barriers to asserting rights are;

- Poor farmers lack money and technical understanding of how to go through the processes. There is a fee that must be paid for the acquisition of DUATS to confirm that the person owns the land, for example, the municipality parcels out 15/30 plots and for these the fees to be paid are 5.652 Mzn for the less valued areas and 12.500 Mzn for the valued ones, this was until 2019[4]. The low levels of literacy of women in the two Districts in our landscape, must make it particularly difficult for them to assert their rights.
- That the Land Law both supports smallholder land-rights and encourages a rights-aware private investment process, but this has been unevenly implemented across the country. This means that local people can be vulnerable to having their land grabbed by elites who argue that they can bring unused land into production. This makes it difficult for those without formal land documentation to defend their land rights against third parties. Of course it also means that they are averse to making longer-term investments

Thus, agencies say that attention is needed to increase the government's implementation capacity, in particular to enable an approach to provide accessible services for communities. As USAID mentioned, "donors could help develop a services center model, or upgrade and consolidate district-level capacity, to deliver land and natural resource services to communities and their members. Donors could help private and civil society actors build awareness of the various legal instruments that individuals and communities can use (such as natural resource inventories, land delimitation services, and legal aid) to secure rights. Donors could support the government to train public officials and local community leaders in facilitating more inclusive development opportunities that promote and mediate community-investor partnerships that involve access to and use of local land. Specific attention should be paid to developing and offering services to meet the needs of women, elders and marginalized groups" (USAID Country Profile: Property Rights and Resource Governance in Mozambique).

Some of implementation focal areas of projects and programs implemented in Mozambique, such as the USAID Integrated Land and Resource Governance (ILRG), identify the key issues:-

- Enhancing community awareness of their rights
- Map and formalize smallholder landholdings
- Support participatory land-use planning
- Set up open process to address grievances over land

The Government of Mozambique has also been focusing on implementation of the law, for example, in April 2015, the GOM launched a large-scale program—Terra Segura—to secure land rights and issue DUATs to five million individuals and four thousand communities by 2019.

6.3.2. Barriers to women accessing land

Despite the presence of the law, many women are severely disadvantaged in their access to land and other natural resources (LANDac, 2018). According to the National Directorate of Land, in 2015, only 20% of DUATs were registered to women and 80% were registered to men (Adriano and Machaze, 2016).

The patriarchal system predominates in rural areas in Mozambique, and in general women live in a relationship of subordination to men. Thus, the main barrier to women accessing land is the **patriarchal system and normative customs**. The reason women do not obtain DUATs is that women usually obtain their rights through customary norms and practices that do not follow national laws, through "secondary" rights. Within most customary systems, women's rights are defined through their relationship to men: women gain access to land through their husbands, fathers, uncles, or brothers. In Mozambique, the woman is considered to be subordinate to the head of the household, who controls access to resources including and in particular, land. In the case of marital separation or death of a husband, the woman returns to her land with no assets.

The **lower educational level** achieved by women and in particular their relatively **lower level of literacy** compared with men, as seen in this report, means that men may find it easier than women to go through the necessary administrative steps to gain access to land. This may affect women's ability to fully understand their rights and to have the confidence to stand up for them.

Without collateral, gender inequality is present in terms of access to credit, which again leads to difficulty obtaining land for women (USAID GENDER ASSESSMENT FORM USAID/MOZAMBIQUE COUNTRY DEVELOPMENT COOPERATION STRATEGY FINAL REPORT JUNE 2019).

The difficulties in access to credit are linked to the lack of identification documents, inexistence of guarantees, difficulty in formalizing business plans, and poor penetration of the banking system, among other aspects. This includes access to M-Pesa, as seen in this report. In female-headed households, whose income comes from agricultural production, lack of knowledge about the facilities to access formal credit from the bank is predominant. As a result of extensive exclusion from formal credit systems, women usually resort informal group saving mechanisms that involve the revolving credit system[5].

4 https://cartamz.com/index.php/sociedade/item/245-calisto-cossa-reduz-taxas-de-duats-na-matola
5 Add link

6.3.3. The impacts of women not holding land tenure

Rural women face a situation of great vulnerability, and even though they are the main producers and responsible for household food security, they have no real decision-making power or real land rights.

Women are increasingly vulnerable to losing their land because of land scarcity in the country (due to population growth and an increasing number of private large-scale land acquisitions). In addition, many widows lose everything upon the death of a husband, even though the Land Law (in combination with the Family Law) dictates that widows should inherit at least half of the shared property (Bicchieri and Ayala, 2017). With increasing land scarcity and the growing pressure of large-scale (private) land acquisitions, women in Mozambique are more and more vulnerable to eviction from their marital land by their in-law family and have poor access and control over land in general (LANDac 2018). Women are rarely allowed to take part in decision-making processes.

6.4. Land ownership and access from the survey

A majority of households report that someone in their household owns a piece of land, with a predictably greater amount of men reporting land ownership than women, with twice as many women reporting no land owned or accessible for farming in the household than men. This could be due to female-headed households being far less likely to own land outright.

A majority of respondents reported having a legal ownership document or title deed (59%), though this was far more common in Barue (79%) than Vanduzi (46%).

For those with no official documentation, half of respondents do not know why their household does not have one. A tenth say that men are more likely to own land than a woman, or that there is not enough money to process the documentation.

Men are more likely than women to say that the main farm plot is owned by them 91% and 78% respectively.

All land in Mozambique is State property, however all Mozambicans have the right of use and enjoyment of the land. Rights to access and use land are officially recognized by the possession of a DUAT, which is obtainable through various means. A majority of respondents reported having a legal ownership document or title deed (59%), though this was far more common in Barue (79%) than Vanduzi (46%). Recent revisions to the 1997 Land Law to encourage agricultural investment raise concerns about private interests outweighing community rights.

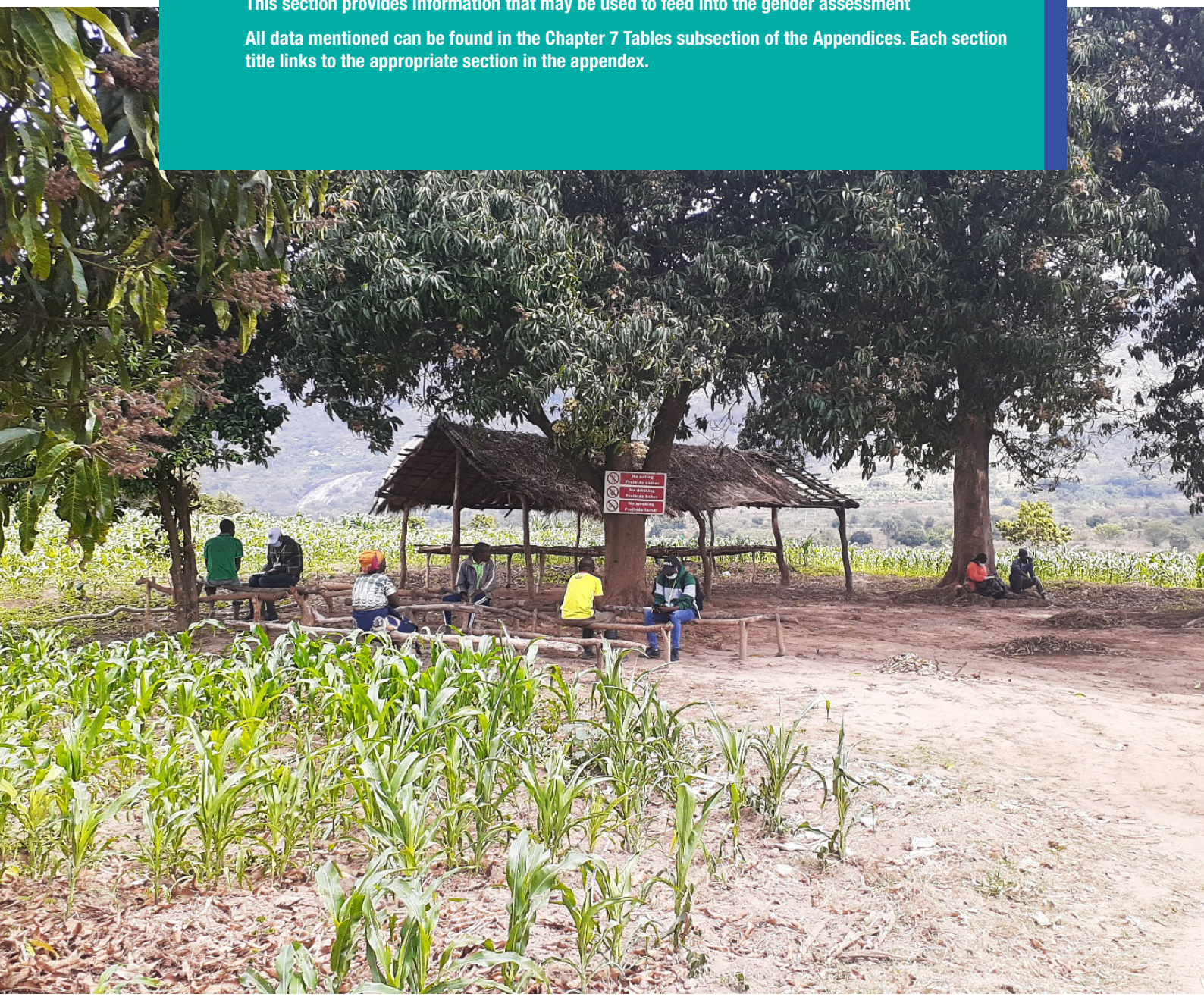
The Land Law of 1997 officially recognizes women as co-title holders of community-held land and further states that all community members (and therefore also women) should participate in decision-making processes. However, the law does not translate to reality, with only 20% of DUATS in 2015 registered to women. Research and interviews point to the patriarchal system and normative customs as the main barrier to women obtaining land and DUATs, as well as lower education and literacy levels.

This gender disparity is a key intervention point.

7. INFORMATION TO FEED INTO THE GENDER RAPID ASSESSMENT

This section provides information that may be used to feed into the gender assessment

All data mentioned can be found in the Chapter 7 Tables subsection of the Appendices. Each section title links to the appropriate section in the appendix.



7.1. Household income sources

In terms of income, most of the interviewed households reported farming as their main income source (92%). This heavy reliance on agriculture means that any changes with income from agriculture will immediately affect the welfare of households in the area. About a fifth of households in Vanduzi also get income from agricultural paid wage labour, and around 15% of those in Barue also get income from other agricultural related businesses like trading, processing, selling inputs, buying, transporting and so on, and 13% from other businesses.

In terms of the one **main** source of household income, farming is by far the primary source, though Barue has 17% who say their main source is business, whether agricultural or non-agricultural.

From the survey, the average amount received by the household in the past 4 weeks, according to the estimate of the respondent, is 11,326 Meticals, approximately US$177. This is much higher in Vanduzi (13,666 Mts) than in Barue (5,581 MTs), and according to male (15,022 MTs), compared with female respondents (6,422 MTs). It should be noted that substantial proportions of respondents refused to provide this household income data, perhaps because they did not feel they were aware of the total, or because they feel this information is sensitive, which reduces the quality of the data. However, the difference between male and female respondents is interesting because the respondent was randomly selected and representing the household, thus there should not be so much of a disparity. It is possible that women are less familiar with the total household income than men, or perhaps that the men have overclaimed their income.

7.2. Hunger

Hunger is quite common across the landscape, with a fifth of survey respondents overall saying that there was a time in the past 12 months when themselves or someone else in their household were hungry but did not eat due to lack of money for food. Women were much more likely than men to say that their household had gone hungry in the past 12 months, possibly because they are more aware than men of the food situation of the household, but also that women responded in less well off households. It is much more widespread in Vanduzi, where 28% had gone hungry than Barue where only 7% claimed to have been hungry. It should be noted that of the households where someone had gone hungry, they were very likely (59%) to say it happened four or more times, indicating chronic hunger.

7.3. What are the farm level responsibilities of men and women?

A majority feel that the activities are done by men and women about equally, harvesting, participating in farmer group meetings, and weeding are the activities for which a majority say both men and women participate equally. Men are more responsible for operating machinery, dealing with pesticides and fertilizers, than both men and women equally.

7.4. Gender norms

Household survey respondents were asked who they feel should be mainly responsible for certain roles, men, women or both men and women equally. A large majority of respondents feel that working on the farm, working in positions of leadership in government, speaking out a public meetings and managing farmer associations and cooperative meetings, should be the responsibility of both men and women equally. Areas much more likely to be considered the responsibility of men than women are getting a job outside the home, deciding how to run the farm, and owning land. This compares with only very few feel that getting a job outside the home, deciding how to run the farm, owning land, managing associations and cooperatives, speaking out at public meetings, working in leadership positions in government and working on the farm, should be the main responsibility of women. So, in other words, whilst most people respect that these roles may be done equally by both men and women, very few feel they should be done by women mainly, but many still think they can be done by men only. This indicates a gender bias in the beliefs about gender roles in the landscape.

Around a fifth of respondents think of women as having quite traditional roles, such as it not being possible for women to manage both children and a farm concurrently, that there are certain tasks or activities that women will never do, or crops or animals that they cannot tend. However, a majority believe that women are capable of managing successful farms, are as capable of managing a farm as a man, and are capable of taking leadership roles in local government administration and committees.

The main task that women are said not to be able to do is tree felling (19%), and 11% who mentioned applying fertilizer.

7.5. What are the roles of women and men in the household with regards to decision-making in different areas?

Both male and female respondents said they personally had a hand in decision making about food crop farming (67% v 68%) and cash crop farming (58% vs 53%). For the following areas, men were more likely than women to say that they participated in decision making about them: poultry raising (51% vs 42%), livestock raising (50% vs 38%), wage and salary employment (52% vs 33%) and non-farm economic activities (small business, self-employment etc) (42% vs 37%). The main areas where women have less say is wage and salary employment, and livestock.

When asked who in the household makes decisions concerning crops to be planted, input us and the timing of harvest, most respondents in Barue and half in Vanduzi said that the man makes the decision. The next most common response was that the decision is made jointly. Only 14% say that women make the decisions, though amongst female respondents, this does go up to 26%.

When it comes to decisions about the use of income generated from any farm activities male respondents are much more likely than female respondents to say they have input into all or most decisions (46% vs 21% respectively).

Male respondents are also more likely than female respondents to say they alone make the **overall decisions** about the farm (41% and 30% respectively), though the largest proportion of both male and female respondents say that decisions are jointly made.

7.6. Education and literacy

A majority of respondents had attended formal school, 88% of those in Barue, and 82% in Vanduzi. It should be remembered that respondents were decision-maker with regards to the cooperative or association the household was a member of so it is possible that the average education of this group may be higher than average education of adults as a whole in the landscape. However, around two-thirds of respondents had completed only primary education. This implies that complex ideas may take some time to explain to some of the household, and participatory and demonstration-based approaches to instruction would work best.

A minority of households have children of school age that are not attending school, this is at 15% in Vanduzi and 10% in Barue. In line with the level of education they had managed to complete, a substantial minority, a quarter in Barue and almost a third in Vanduzi, cannot read or write. This level of illiteracy will obviously constrain some of the communications methods possible for SUSTAIN and your partners. There is a big gender gap here, with only 42% of female respondents able to read and write compared with 97% of male respondents. Literacy has an impact not just on ability to read communication materials, instructions on products and so on, but also in confidence. It is important that any interactions with farmers ensures that the low levels of literacy of women is taken into account and that male counterparts in the household do not receive all the training and information. As a key informant from the Mozambique Agricultural Research Institute put it,

"First, it is women who face more difficulties than men, with two aspects combined, first there is the issue of illiteracy, which she does not even want to exist and the importance of this, then there are cultural issues while in a family the husband is the one who should be in the front of everything".

In around half of the households, a higher proportion in Barue, and lower proportion in Vanduzi, the oldest female in the house could read and write. In nearly 80% of households the head of the household or the spouse could read or write. This is slightly lower in households with female respondents.

7.7. Media access

Nearly all of the households at which the survey was conducted (98%) own at last one mobile phone in working order.

A majority, 78%, of respondents own a personal mobile phone in working order which is connected to a sim and network. This is higher in Barue than Vanduzi, and higher among men (93%) compared with women (62%). At this level of ownership, mobile phones are a viable tool to use as part of project implementation methodologies, though there is a need to ensure that no women are excluded because of this.

A further 21% of women have access to a phone that they can use if they want, however, there are usually constraints associated with this kind of mobile phone access because of difficulties accessing the phone or paying for airtime. Nearly three-quarters of respondents in Vanduzi own a radio. Ownership is lower in Barue, at 57%. Television ownership is higher in Barue than Vanduzi, but is at 28%. Both radio and TV are useful tools for spreading knowledge about sustainable agricultural methods. Even though TV does not reach a majority of households, those that it does will be impacted by the visual aspects of communication. The dissemination of information by radio could address the problem the key informant with the Micaia Foundation pointed out:

"the way the communities are distributed, they don't have access to information, for example, you can set up a meeting in their community, in a headquarters, in a school, there are people who live very far from the school, and those people don't have the means to be trained in this knowledge and they end up practicing the traditional system of production".

7.8. Male and female representation in cooperatives and associations

Farmer producer groups and savings groups are the group types most widely thought of as being present in the area in which the respondent lives. In reality we know that awareness of farmer producer groups are higher than this, since all respondents are a member, only that some categorize their own group as being based outside their particular area. The next most well-known groups are local authority committees and similar, such as water catchment committee, land use committee and village environmental committee.

Almost all those aware of a farmer producer group are also members of one (43%). Membership of savings groups is next most common (28%) but much lower than awareness, however.

For most group-types known of both men and women are accepted as members. 45% of respondents say that the farmer producer group they are a member of has a mix of equal numbers of men and women, but for 40% say there are more men than women, and 14% say there are more women than men. Similar, thinking about the committee of the farmer group they are a member of, 39% said it's a mix of men and women, 36% said it had more men than women, and 16% said it has more women than men. Thus, on average, there appear to be more male than female members of farmer producer groups, and more men on the management committees.

92% of households report farming as their main income source. Average household income varies across the districts, but an important point revealed in the survey is the wide income disparity between men (15,022 MTs) and women (6,422 MTs), though a significant number of respondents refused to provide income data, which colours the reliability of this data.

Hunger is commonly reported in the landscape, with women much more likely to report having gone hungrey in the past 12 months. 59% of households that reported going hungry did so more than 4 times in the past year, indicating chronic hunger.

The data showed a large number of people felt men and women could participate in leaderhip positions, public meetings, and farm manegment equally, though the majority espoused more conservative, gender segregated views on farm and home responsibilities.

Around two-thirds of respondents had completed only primary education. This implies that complex ideas may take some time to explain to some of the household, and participatory and demonstration-based approaches to instruction would work best. A substantial minority, a quarter in Barue and almost a third in Vanduzi, cannot read or write. This level of illiteracy will obviously constrain some of the communications methods possible for SUSTAIN and your partners. There is a big gender gap here, with only 42% of female respondents able to read and write compared with 97% of male respondents. Literacy has an impact not just on ability to read communication materials, instructions on products and so on, but also in confidence. It is important that any interactions with farmers ensures that the low levels of literacy of women is taken into account and that male counterparts in the household do not receive all the training and information.

A majority of respondents reported owning a mobile phone with a SIM and connection to network, 93% of men and 62% of women, again indicating a need to creatively reach women with your interventions.

For most group-types known of both men and women are accepted as members. 45% of respondents say that the farmer producer group they are a member of has a mix of equal numbers of men and women, but for 40% say there are more men than women, and 14% say there are more women than men.

8. KEY STAKEHOLDERS IN THE LANDSCAPE

8

This section identifies and describes key stakeholders involved in managing the landscape (Relating to Activity 2.1.1 “Consultative landscape diagnosis, including stakeholder mapping, risks and opportunities assessment for nature-based solutions”)

Moniquera Cabbage farm. Photo © Ipsos Mozambique

At the national level, a hierarchical structure has been adopted by the government of Mozambique, for the management of the districts in each Province of the country, starting with the national administrator, and going down to the administrator's office, and the district secretariat (includes functions not attributed to another district service), and then we will find here several district services for the community, as is the case of education, youth and technology, health, women and social action, economic activities, and other services, which includes agriculture, land and environment. (Imhambane)

"The Decree of the Council of Ministers, No. 15/2000, establishing forms of articulation of local governments of the state with community authorities, acknowledging that structures and dynamics of local authorities are truly different, so the provisions of administrative bodies must be different to be able to face each social reality in the country. In other words, the community choose their secretaries, or other leaders, who are then legitimized by the state. Whilst the types of leadership is stated in law, what happens is that depending on the locality, you will find different types of leadership. For the purposes of this decree, community authorities are chiefs, neighbourhood or village secretaries, and other leaders legitimized as such by the respective local communities." (Decreto 14/2000)

"The Decree 15/2000 combines the objective of re-claiming state sovereignty by extending administrative and territorial reach to rural areas with the recognition and delegation of tasks to localised forms of organisation. This has been loosely formulated in the Decree as instituting an articulation between local state organs and community authorities: For the process of administrative decentralisation, for giving value to the social organisation of communities and

improving their participation in public administration for the socio-economic and cultural development of the country", (Decreto 15/2000, Introduction).

The tasks that the community authorities are obliged to perform can roughly be grouped into six:

- Administrative and Governmental outreach: the Decree provides for an extension of the state apparatus by delegating state functions to community authorities, such as taxation, census/registration, justice enforcement, policing, land allocation, road maintenance, health, education, development project implementation, environmental sustainability, labour and food security (Regulamento do Decreto 15/2000).
- Nation Building: "in accordance with the consolidation of national unity" (Decreto 15/2000, art. 4).
- Rural Development: the administration and civic education of the rural population on the one hand and to the creation of labour opportunities, agricultural production, environmental sustainability and schooling on the other and the community authorities are expected to become the organisational link between NGOs and projects and rural communities.
- Civic education: Nurture the production of citizens by the disclosure of state law (Regulamento art. 5a), along with the prevention of crime and the maintenance of peace and social harmony. (Decreto 14/2000)
- Local Community Participation: The Decree and the Regulamento highlight local community participation as the primary aim of the recognition of community authorities, but provide no concrete tools or recipes for how local participation should be ensured or what form it should take.
- Recognition of 'traditional authority' and culture: Besides providing a general step towards recognition of traditional authority, which was banned at independence, the Decree and the Regulamento obligate community authorities to uphold local customs, uses and cultural values (ibid: art. 5b), and to participate in investigating forms of local traditional culture such as dances, food, songs, music and ceremonies (ibid: art. 7d–f).

This is a complicated list of activities for the community authorities to carry out because there is little guidance on how to put into practice the double role of community-representative and state-assistant (Buur & Kyed). Just over 4,000 'community authorities' have been recognised since 2002.

In the case of the Districts and Villages within Manica the above-described community authorities, once legitimized, are recognized by the competent representative of the State. In the performance of their administrative duties, the local organs of the state at the District level engage with the community authorities, listening to opinions about the best way to mobilize their participation, and in the planning and implementation of economic, social, and cultural programs and plans, for the benefit of local development. The engagement may be with one or more authorities of the same community or of different local communities, according to the service. Examples of the areas of working together are (a) peace, justice and social harmony, (b) Census and registration of the population, (c) civic education and raising the patriotic spirit, (d) Land use and benefit, (e) employment, (f) food security, (g) housing, (h) public health, (i) education, and culture, (j) environment. (k) opening and maintenance of access roads.

The main services at the District level are:

- Services of planning and infrastructure
- Services of Education, Youth and Technology
- Services of Health, Women and Social Action
- Services of Economic activities
- Services of Other services (Inhambane)

The Provincial Directorate of Land, Environment and Rural Development is the provincial body of the State apparatus which is tasked with managing natural resources. In accordance with the principles, objectives, and tasks defined by the Government it directs, plans, coordinates, controls and ensures the execution of policies in the fields of administration and management of Land and Geomatics, Forests and Wildlife, Environment, Conservation Areas and Rural Development.

With regards to **land**, they carry out technical work related to Surveying, Cadastre, Geodesy and Cartography and supervise the correct application of the Land Law and pertinent regulations and exercise control over land occupation in the area of the province; including issuing titles, overseeing the land registry. Within the scope of **forests** they ensure the licensing, conservation, enforcement of the use and rational use of forest resources. With regards to the **environment,** they carry out environmental licensing, evaluation, auditing, inspection and surveillance of the environmental impact of socio-economic activities. For **rural development**, they implement integrated and sustainable rural development policies and strategies and promote community participation and strengthen associativism in local economic development processes. For **wildlife conservation and management**, they implement rules and procedures on the sustainable management of wildlife resources, to ensure the licensing, management, protection, conservation, inspection and monitoring of the use of wildlife resources (Maputo).

Community inclusion in natural resource management

As noted previously in this report, Mozambique's supreme law vests custodianship of land in the state with the ownership, management, and administration of such land devolved to a variety of other stakeholders including agencies of the state, the private sector and local communities under customary arrangements. The constitution maintains that natural resources existing in the soil, sub-soil, internal waters, the territorial sea, the continental shelf and the exclusive economic zone, are state property, with the state determining the conditions for their use by the citizens. Rural communities are enabled in that the state, through the constitution, recognizes and protects community land rights acquired by inheritance and by virtue of community traditional and peaceful occupancy of such areas.

According to Negrão (2002), the constitutional recognition of community land rights independently from formal titles has provided a great sense of protection to the majority of the rural population for whom land continues to be the only source of subsistence and income. The law furthermore recognizes the "local community", as the main entry point to integrating various interests on communal land, recognizing them as constituting "extensive land holding and resource management units reflecting local production and social systems involving a wide range of resources and dynamic patterns of land use" (Negrão 2002, Durang and Turner 2004). Through the local community, local people were given the right and duty to participate in the legalization (demarcation and registration) of new DUATs allocated to investors. A key element in this context is the requirement that investors have to consult local people and secure their approval before they are able to obtain a new DUAT (Salomão, 2006).

Weaknesses in natural resources management in Mozambique

Some of the weaknesses in natural resource management in Mozambique are:-

- lack of transparency in the management and channelling of revenues from the exploitation of mineral and oil resources to the communities in the exploited areas.
- Lack of community participation in decision making, for example the society is not included in the choices of the programs implemented in their areas (Silva, 2018).
- The Mozambican state institutions are not strong enough to steer natural resources through conceptual goals.
- No institutionalization of the system of "checks and balances" that consists among other precepts, the separation of powers and accountability of contracts and concessions signed between the Mozambican government and national and foreign companies operating in the country.

Other organizations in the landscape

The following are some other organizations operating in the landscape. These are in addition to the descriptions provided of the organizations in which some of the key informants worked.

- AQUA- Agência Nacional para Controle da Qualidade e Ambiental (AQUA), Institution under the Ministry of Land and Environment (MTA), with the responsibility of ensuring compliance with the implementation of environmental management standards and procedures as well as coordinating, promoting, monitoring and conducting research on environmental quality for the sustainable development of natural resources, terrestrial and coastal-marine.
- Oceanographic Institute of Mozambique (InOM) – former Institute of Fisheries Research (IIP)Public institution subordinated to the Ministry of Sea, Inland Waters and Fisheries, responsible for research and scientific research activities, development of knowledge capital, technological and innovation, endowed with legal personality, scientific, administrative, financial and patrimonial autonomy.
- National Fund for Sustainable Development (FNDS)- Institution under the Ministry of Agriculture and Rural Development (MADER), whose main objective is to promote and finance programs and projects that guarantee sustainable, harmonious, and inclusive development, with particular emphasis on rural areas.

- NCBA CLUSA MOZAMBIQUE- As one of the first international non-governmental organizations to engage in market-based development in Mozambique, NCBA CLUSA pioneered market-linked producer organizations and helped create an enabling environment for farmer associations and agricultural cooperatives – all while building local capacity. From the onset of NCBA CLUSA's work in Northern Mozambique, we believed that investing in people early on would ensure that our interventions were sustainable and would lead to significant long-term impact. Since 1995, NCBA CLUSA has built the capacity of thousands of Mozambicans – including our own and partner staff, government officials and, most importantly, the leaders and members of producer organizations and small agribusinesses that continue to play an integral role in rural markets.
- BAGC – A public private partnership attracts and supports new investment to boost agribusiness in the corridor.The BAGC works with investors in the following ways: Help in locating and assessing potential investment locations, Facilitating discussions with local communities to create win-win developments, Assist in strengthening Government relations, Provide guidance in important areas of legislation and policy Facilitate access to complementary finance, Introduce potential partners to enhance and de-risk planned investments.

There is a need for better awareness amongst the population about the dynamics of the management of the various resources in the country. According to data in the area of natural resources management, illiteracy is one of the dilemmas that hinder the community from being able to revendicate any mismanagement of natural resources. The data shows that the government of Mozambique is not transparent with regard to information about the management of natural resources, the revenues made by the state; large projects and agricultural programs, are never publicly presented to the communities.

9. APPENDICES

9.1. Soil testing contact details

Two soil testing providers were identified in Mozambique:

- SGS is a leading provider, they are fully accredited and qualified to perform soil testing according to national and international quality standards. SGS MOZAMBIQUE LDA., Avenida da Namaacha, km 1.5, nº 8274, Cidade de Maputo, Maputo, 1116, Mozambique, T+258 84 326 2030.
- Soil Technic conducts soil survey, soil investigation, sample testing and produces reports in their laboratory locally. They are planning to develop a system of mobile laboratory to circulate to all provinces depending on the magnitude of the work. Company email: info@soiltechnic.co.mz, Phone: +258 87 722 3560, Company cell: +258 85 077 3333, Company website: www.soiltechnic.co.mz

Enumerators in Chidengue Village. Photo © Ipsos Mozambique

9.2. Acronyms and abbreviations

CAPI	Computer Assisted Personal Interviewing
DiD	Difference in Difference
EM	Evaluation Matrix
EQ	Evaluation Questions
ESRC	Ethics and Scientific Review Committee
FGDs	Focus Group Discussions
FP	Family Planning
GIRL	Girls Improving Resilience Through Livelihoods
GIRL-H	Girls Improving Resilience Through Livelihoods + Health
HDDI	Household Dietary Diversity Index
HIV	Human Immunodeficiency Virus
IDDI	Individual Dietary Diversity Index
LMS	Livestock Market System
MEL	Monitoring, Evaluation, Accountability & Learning
PPI	Poverty Probability Index
REAL	Resilience Analysis, Research and Learning
RIM	Random Iterative Method
SPSS	Statistical Package for the Social Sciences
VSLA	Village Savings and Loan Association
DPASA	Direção provincial de Agricultura e segurança Alimentar
DPIC	Direção Provincial da indústria e comercio
IIAM	Centro Zonal
IAM	Instituto Agrário de Chimoio
ISPM	Instituto Superior Politécnico de Manica
IAV	Insumos Agrícolas e Veterinários
Luterari	Insumos e serviços agrícolas
ETG	Export Trading Group
SEEDCo	Seed Company

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9.4. Definitions of terms

Table 3. Definition of terms

TERM	DEFINITION
Agri-businesses	Agri-businesses: is an enterprise engaged in the producing operations of a farm, the manufacture and distribution of farm equipment and supplies, and the processing, storage, and distribution of farm commodities.
Agroecological Approaches	Agroecological Approaches address how the components of the agroecosystem interact, aiming for sustainable farming systems that optimise and stabilise yields. The agroecology social movement promotes the multifunctional roles of agriculture while promoting social justice, nurturing identity and culture, and strengthening the economic viability of rural areas
Ecosystem restoration	Ecosystem restoration is defined as "a process of reversing the degradation of ecosystems, such as landscapes, lakes and oceans to regain their ecological functionality; in other words, to improve the productivity and capacity of ecosystems to meet the needs of society. This can be done by allowing the natural regeneration of overexploited ecosystems or by planting trees and other plants" (UNEP, 2019). Ecosystem restoration is guided by principles adopted by the Parties to the CBD (CBD, 2019). It: i) Is a complement to and should not replace conservation activities; ii) Should be consistent with CBD provisions including the ecosystem approach principles; and, iii) Should be planned at various scales and implemented using the best available science and traditional knowledge.
Food security	Food security is about ensuring access to sufficient, safe and healthy food that is produced sustainably for all people and future generations. It requires taking a holistic approach to food production, processing, distribution, sale and consumption – i.e. a sustainable food systems approach
Forest and Farm Producer Organisations (FFPOs)	Forest and Farm Producer Organisations (FFPOs) are defined as formal or informal associations created by and for their members. They fulfil four main roles; representing smallholder farmers and their interest, providing economic services, providing extension services and providing public goods
Gender responsive	Gender responsive: the outcomes that reflect an understanding of gender roles and inequalities and which make an effort to encourage equal participation and equal and fair distribution of benefits
Growth Corridors	Growth Corridors are more than simply the transport route itself; the term signals either the concentrated presence of economic activity that is related to the route, or an explicit policy initiative that takes advantage of the transport infrastructure. The growth corridor concept was endorsed by the World Economic Forum, after having been presented as a concept during the UN GA in 2008, and has become a main element of the Malabo declaration, an inter-governmental strategy for agricultural growth in Africa, adopted by CAADP. The logic behind the concept is that improved access and new settlements, with well payed workers, will create conditions for intensified agriculture. Thus making the assumption that; "with improved access to markets and agricultural inputs, the principle barriers to agricultural innovation and intensification will be broken down
Inclusive Green Growth (IGG)	Inclusive Green Growth (IGG**)** has been identified as a pathway to achieving the 2030 Agenda for Sustainable Development and strives to support growth that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcity. IGG refers to trajectories for economic growth that are sustainable and socially inclusive, in which there is equitable ownership, access to and sharing of benefits from natural resources, and in which biodiversity conservation is integral to planning and management of land and water resources and investment choices
Integrated Landscape Approach	An Integrated Landscape Approach is a systems approach that optimises multi-functionality. It integrates multi-sectorial planning and participatory approaches, facilitates setting out a stakeholder negotiation framework for land- and resource-use decisions and for balancing the trade-offs inherent in such large-scale approaches, and recognises the use of overlapping cultural, social, and governance "landscapes" within biologically defined areas. A landscape approach facilitates long-term collaboration among different groups of land managers and stakeholders to achieve the multiple objectives required from the landscape. It involves broad stakeholder participation, negotiation around objectives and strategies, and adaptive management based on shared learning. **Examples:** Practices and solutions for integrated governance and sustainable agricultural production (relevant to institutions) • Multi-stakeholder forums for collective decisions • Promotion and scale up of nature-based solutions Managing common goods (water, biodiversity, etc.) • Collaborative governance among different actors • Partnerships to drive investment on sustainable production practices
Integrated Landscape Management (ILM)	Integrated Landscape Management (ILM) refers to the collaborative, multi-stakeholder process that produces a sustainable landscape. With ILM, stakeholders work together to resolve complex issues, such as water scarcity, biodiversity decline, deforestation, or farmer adaptation to climate change, that cannot be successfully resolved by actors working alone or through farm level or supply-chain interventions

TERM	DEFINITION
Land health	Land health is defined as the capacity of land, relative to its potential, to sustain delivery of essential ecosystem services
Landscape Partnerships	Landscape Partnerships are defined as entities that undertake Integrated Landscape Management, i.e. the collaborative, multi-stakeholder actions and processes that contribute to producing sustainable landscapes. The governance structure, size and scope, and number and type of stakeholders in these partnerships will vary depending on the context
Nature-based solutions (NbS)	Nature-based solutions (NbS) are defined as actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. Some examples of farmer level practices that entail nature-based solutions: [HINT: Practices that can combine climate change mitigation, adaptation, disaster risk reduction, biodiversity conservation, and sustainable resource management] • reducing tillage • planting trees • protection of wildlife corridors • securing land rights for indigenous people (the question of whether the farmer has got a "title"/CCRO for the land owned. • Rain water harvesting • Crop rotations (Diversifying annual cropping systems to include legumes, perennial crops, etc in rotations) Reintegrating grazing animals back into cropping systems • Using cover crops • Protection of river banks
Sustainable Food Systems	Sustainable Food Systems are defined as a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised
Tarissfupi	Tarissfupi is a simple rapid bio-assessment method that can be used to monitor the health of a river and measure the general quality of the water in that river. TARISSfupi was specifically developed for use by Water User Associations (WUA) in Tanzania in water resources management particularly for river health assessment
Sustainable farming	Environmentally sound practices that conserve healthy, biodiverse, productive landscapes and soils, retain moisture, benefit nutrient cycling, decomposition and soil structure and help control pests and diseases for the secure, long-term production of food, feed, fibre and energy Some examples of farmer level sustainable agriculture practices; • no or minimum tillage • mixing crops in a single plot • pasture cropping • use of compost and animal manure • planting windbreaks to protect the farm/crops • drip irrigation • Controlling pests by using a range of methods (mechanical, biological etc) • Control of soil erosion • Minimizing water pollution
Land degradation	Reduction or loss of the biological or economic productivity and complexity of land resulting from land uses. Land degradation can occur as the result of soil erosion caused by wind or water, deterioration of the physical, chemical and biological or economic properties of soil, or long-term loss of natural vegetation
Forest landscape restoration	The ongoing process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes comprising overlapping ecological, social and economic activities and values
Land restoration	Land restoration is a process of reversing the degradation of land to regain its ecological functionality; in other words, to improve the productivity and capacity of land to meet the needs of society. This can be done by allowing the natural regeneration of overexploited land or by planting trees and other plants" Land restoration is a complement to and should not replace conservation activities. Land restoration should be planned at various scales and implemented using the best available science and traditional knowledge.

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