Adding Value to the Arc Project:
the Endline Household Livelihood Survey

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List of Abbreviations

AVA	Adding Value to the Arc
ATV	Abood Television
CBFM	Community Based Forest Management
EU	European Union
ER	Expected Result
IGA	Income Generating Activities
ITV	Independent Television
JFM	Joint Forest Management
KAP	Knowledge Attitude and Practice
Kanga FR	Kanga Forest Reserve
VLUP	Village Land Use Plan
MJUMITA	Mtandao wa Jamii wa Usimamizi wa Misitu ya asili Tanzania
MVDC	Mvomero District Council
Mkingu NR	Mkingu Nature Reserve
PDD	Project Designed Document
TBC	Tanzania Broadcasting Cooperation
TFCG	Tanzania Forest Conservation Group
TFS	Tanzania Forest Services Agency
VC	Village Council
VNRC	Village Natural Resources Committee
VSLA	Village Saving and Loan Association
VLUMC	Village Land Use Management Committee

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1.0 INTRODUCTION

1.1 About the project 'Adding Value to the Arc: Forests and Livelihoods in the South Nguru Mountains'

The Tanzania Forest Conservation Group (TFCG) in partnership with the Community Forestry Network of Tanzania commonly known by its Swahili acronym as MJUMITA (Mtandao wa Jamii wa Usimamizi Misitu Tanzania), Mvomero District Council (MVDC) and the Tanzania Forest Services Agency (TFS) were awarded a grant from the European Union (EU) to implement a project known as "Adding Value to the Arc: Forests and Livelihoods in the South Nguru Mountains" (AVA). The primary objective of the project was to alleviate poverty and improve economic resilience among marginalized rural, natural resource-dependent communities living in Mvomero District in Tanzania. The project aimed to achieve its goal by supporting more sustainable, forest management through Community Based Forest Management (CBFM) and Joint Forest Management (JFM). This report documents the endline household information in March 2018, after 63 months of the project.

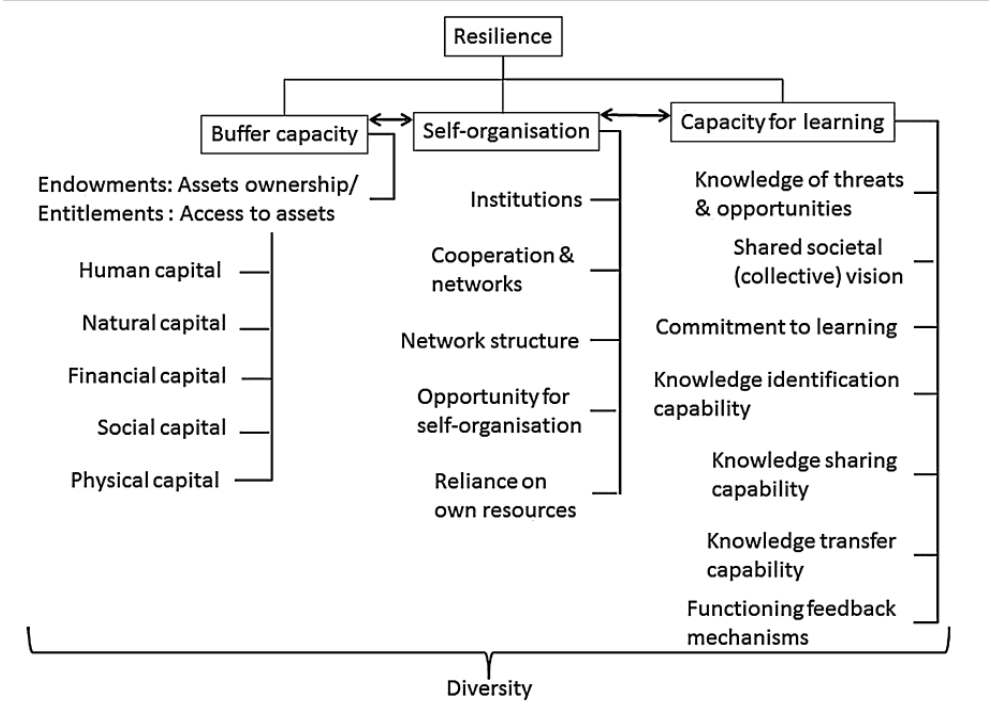
1.2 Objective of this report

The objective of this report is to describe the livelihood status of households in project villages at the close of the Adding Value to the Arc Project, and to identify how livelihoods have changed since the beginning of the project. The report also investigates the degree to which changes are attributable to project interventions.

The endline household report is compared with the baseline household livelihood report as documented in Lyimo, 2014, in order to determine changes and progress of achievements and results based on the project's indicators as presented in the logical framework.

The project follows the analytical framework proposed by Speranza *et al.* 2014 for monitoring livelihoods resilience to climate change. The model has been adopted for its relevance to the rural, agricultural context that the project is operating in and has been adapted to reflect the project's interest in the role of forests and woodlands in climate change resilience.

Figure 1. A conceptual and analytical framework for characterising livelihood resilience.



Source: Speranza *et al*. 2014

This model distinguishes between three major attributes of livelihood resilience: buffer capacity, self organisation and capacity for learning.

Buffer capacity is defined as 'the capacity to cushion change and to use the emerging opportunities to achieve better livelihood outcomes such as reduced poverty.' (Speranza *et al*. 2014). The project included interventions targeting each of these types of capital.

In the context of this survey we have included variables relating to these key assets.

Human capital – relevant variables include education of the head of household, % of school age children in school, and knowledge of improved agricultural techniques.

Project interventions aimed at enhancing human capital: environmental education including the establishment of eco-schools with a focus on reducing school drop-out rates and enhancing education outcomes; training on agricultural skills including conservation agriculture and livestock (poultry).

Natural capital – relevant variables include land ownership and access to forest resources

Project interventions aimed at enhancing natural capital include the establishment of community-based forest management as a means to safeguard access to forest resources.

Financial capital – relevant variables include incomes, dependency ratio, asset ownership including livestock and other productive assets (phones, bicycles, radio, solar energy systems, ploughs).

Physical capital – relevant variables include housing condition and access to water supplies.

Project interventions aimed at enhancing financial and physical capital included support for the village savings and loans associations and training on income-generating activities such as Allanblackia, sustainable charcoal and timber production, and agriculture.

Self-organisation is viewed in terms of general self-organisation and autonomous self-organisation. Speranza defines these terms as follows:

General self-organisation in social systems refers to the spontaneous emergence / re-creation of society (rules, norms, values, and organisation) through a dialectic of social structures (top-down processes) and human actions (bottom-up processes), without explicit control or constraints from outside the system.

Autonomous self-organisation refers to a state where actors determine their own rules. Under conditions of crisis and instability, social self-organisation ''denotes that the individuals affected by the emerging structures determine and design, the occurrence, form, course and result of this process all by themselves.

Capacity for learning connotes adaptive management, implying that a resilient SES is a learning system that incorporates previous experiences into current action and thus has

The survey included variables to assess this including those relating to governance of land as well as membership of village savings and loans associations. The project included interventions to support both of these areas of self-organisation, as well as other forms of organistaion including support for the MJUMITA networks.

Capacity to learn is broadly defined by Speranza et al. (2014) in terms of adaptive management. In the context of this survey, we considered changes in knowledge and behavior, particularly those linked to climate change. Project interventions linked to this include awareness raising and training on issues around participatory forest management, climate change and climate change adaptation.

These attributes were integrated into the design of the survey.

1.3 Methodology applied

The end-line evaluation applied a quasi-experimental sample design. The same survey questions that were asked during the baseline survey were repeated in the same nine villages at the endline. An additional three villages were included in the endline to reflect the increase in the total project villages from 34 at the baseline to 38 at the endline. Therefore, the sample size increased from 9 to 12 villages.

1.3.1 Sampling design

Nine of the 12 villages included in the endline survey were the same nine villages as were included in the baseline survey. An additional three villages were added. The baseline selected 9 villages from the 34 villages initially involved in the project. This was equivalent to 30 % of the project villages. The villages were selected through stratified random sampling. Stratification was based on the proposed participatory forest management regime. In this selection the names of all the project villages implementing both CBFM and JFM were written in different pieces of paper and placed on the container. Villages implementing only JFM and CBFM separately were also written on small pieces of paper and placed in separate containers as well. The containers were shaken and the enumerator selected three villages implementing JFM only, four villages implementing both CBFM and JFM and two villages implementing CBFM only. The additional villages were selected based on the same pocedures of which all JFM villages are now included in the baseline, then simple random was used as in the previous villages to select one village. This procedure applied both for the villages which practice both CBFM and JFM and the villages which practice CBFM only, so in each category one additional village was selected.

1.3.2 Determination of the number of respondents to be sampled

Numbers of households for inclusion in the survey were selected by using simple random sample techniques as applied in the baseline. At each selected village 5% of the households were randomly selected to conduct interviews. A total of 264 households were selected for interviews during the endline survey while 200 households were interviewed in the baseline survey (Table 1).

1.3.3 Determination of the key informant respondents

Purposive sampling was used to select Key informants for interviews which included the Village Chair and Village Executive Officers, Beekeepers group leader, Masambu group leader, Conservation Agriculture (CA) group leaders, Village Natural Resource Committee (VNRC) leaders and Village Council (VC) members.

1.3.4. Review of the project documents

The project database, activity reports and village records were reviewed and included in the report as part of findings.

Table 1: Village surveyed and number of households surveyed per village

	Baseline Villages				Endline Villages			
S/N	**Village**	**No. of HH surveyed**	**Type of PFM**	**Nearby forest**	**Village**	**No. of HH surveyed**	**Type of PFM**	**Nearby forest**
1	Bwage	20	CBFM and JFM	Kanga FR	Bwage	20	CBFM and JFM	Kanga FR
2	Difinga	30	CBFM and JFM	Kanga FR	Difinga	30	CBFM and JFM	Kanga FR
3	Kanga	28	CBFM and JFM	Kanga FR	Kanga	28	CBFM and JFM	Kanga FR
4	Kinda	15	JFM	Mkingu NR	Kinda	15	JFM	Mkingu NR
5	Masimba	28	CBFM	Not bordered with forest	Masimba	28	CBFM	Not bordered with forest
6	Maskati	22	JFM	Mkingu NR	Maskati	22	JFM	Mkingu

	Baseline Villages				Endline Villages			
S/N	**Village**	**No. of HH surveyed**	**Type of PFM**	**Nearby forest**	**Village**	**No. of HH surveyed**	**Type of PFM**	**Nearby forest**
								NR
7	Mndela	10	JFM	Mkingu NR	Mndela	10	JFM	Mkingu NR
8	Msolokelo	21	CBFM and JFM	Mkingu NR	Msolokelo	21	CBFM and JFM	Mkingu NR
9	Ndole	26	CBFM	Not bordered with forest	Ndole	26	CBFM	Not bordered with forest
					Kibatula	20	CBFM andJFM	Kanga FR
					Mafuta	21	JFM	Mkingu NR
					Diburuma	23	CBFM	Not bordered with forest
Total		**200**				**264**		

Source: Field survey, 2013 and 2018

1.3.4 Data collection methods

Structured interviews with heads of households

The baseline survey employed a mixture of qualitative and quantitative methods for data collection. A structured questionnaire comprised of open and closed questions was used to collect both quantitative and qualitative data from the selected households, and the same were employed for the endline survey. The heads of households were the targeted population for interviews (Annex 2).

Key informant interviews

The Key Informant Interviews (KIIs) were employed also in the survey. KIIs provided qualitative data to provide insights that the people had about the local issues. The interviews under this method were guided by a checklist (Annex 3).

Survey dates and team

Data collection in the field was carried out for three weeks from 20th February to 11th March 2018 (Table 2). A total of 5 field staff were involved, comprised of 3 enumerators, 1 field assistant and 1 supervisor (Monitoring and Evaluation officer). Prior to data collection, experienced enumerators were recruited and trained for one day on data collection particularly on how to administer the field instruments. Testing of questionnaire was also done at Dihinda village by interviewing 10 respondents. This was very important as it helped to improve the interview techniques and make more clarification to some questions.

Table 2: Survey dates

S/N	Village Name	Date of data collection
1	Kibatula	20/2/2018
2	Bwage	21/2/2018
3	Kanga	22/2/2018
4	Ndole	23-24/2/2018
5	Kinda	24-26/2/2018
6	Maskati	27/2/2018
7	Msolokelo	1/03/2018
8	Masimba	2/03/2018
9	Diburuma	3-4/03/2018

S/N	Village Name	Date of data collection
10	Mafuta	5-6/03/2018
11	Mdela	8-10/03/2018
12	Difinga	11/03/2018

Source: Field survey, 2018

1.4 Data management and analysis

Qualitative data (FGDs and KIIs) were summarized around themes. Quantitative data were coded and entered into computer spreadsheet of excel. Analysis involved generation of descriptive statistics such as percentages, multiple responses and cross-tabulation.

1.5 Limitation of the survey

In carrying out this survey, the team faced some challenges. Firstly, the team failed to obtain all the required information from the household such as amount of harvesting of some crops, amount of crop consumed or sold. This is because the villagers did not keep records. To overcome this, we asked the villagers to estimate of what they harvest per crop in one acre per season. Secondly, some of the selected households during sampling were not in their original premises as they were shifted to other sub villages. In these situations, the enumerator chose the nearest households to be interviewed. Thirdly, the selected households were very scattered in the studied villages as such it was very difficult to move from one household to the other and in some cases it was difficult to find the household (10 households were not found and the team decided to choose another household). In this case the enumerators moved for long distances until they found the household and for those households which were not found, we selected the households which were within the area.

2.0 Survey findings and discussion

2.1 Demographic information

2.1.1 Gender

During the baseline survey for the first project, the survey interviewed 25 women (13%) out of 200. This survey for the endline, the survey interviewed 56 women out of 264 (21%). This was attributed to the culture whereby the spokesperson for households is often a man (Table 3). Furthermore, it was noted that 80% of the households interviewed are headed by men and 20% by women. This showed a difference when comparing with baseline as 85% of the household interviewed were headed by men and 15% were headed by women. In both surveys, households headed by women are due to either their husbands have passed away, they are divorced or they were not married. This pattern is common in Tanzania and other studies have reported similar trends (Kasamila and Marusuli, 2004; Nonga, 2010).

Table 3: Respondents by gender per village

S/N	Village	Male	Female	Total	% of HH headed by Male	% of HH headed by female
1	Bwage	14	6	20	70	30
2	Diburuma	22	1	23	96	4
3	Difinga	21	9	30	70	30
4	Kanga	18	10	28	64	36
5	Kibatula	18	2	20	90	10
6	Kinda	13	2	15	87	13
7	Mafuta	16	5	21	76	24
8	Masimba	26	2	28	93	7
9	Maskati	16	6	22	73	27
10	Mndela	10	0	10	100	0
11	Msolokelo	16	5	21	76	24
12	Ndole	18	8	26	69	31
Total		**208**	**56**	**264**		

Source: Field survey, 2018

2.1.2. Age distributions

During the baseline survey, ages of household members were in the age category of 0-5 years (20%), 6-10 years (20%), 11-17 years (20%), 18-49 years (23%), 50-60 (13%) and over >60 (4%). It was also realized that non-working group (those younger than 18 years or older than 60 years) were 44% of the household members while the working age group (those 18 years and above up to 60) were 56% of the household members. During this survey distribution of age of the household were 0-5 (17%), 6-17 (37%), 18-35 (22%), 36-55 (18%), 56-65 (2%) and above 65 (3%). This information shows that 57% of household members are dependents (aged 0-17 and > 65 years) giving a total dependency ratio of 112.

Table 4: Age distributions per village

Village	0-5	6 _17	18 _35	36 _45	46_55	56_65	Above 65	Total
Bwage	22	51	14	11	0	2	6	106
Diburuma	23	51	24	20	18	3	0	139
Difinga	16	67	48	25	7	4	2	169
Kanga	17	57	19	18	10	6	10	137
Kibatula	45	69	24	17	10	3	4	172
Kinda	19	26	20	8	6	2	5	86
Mafuta	17	46	34	27	9	1	1	135

Village	0-5	6 _17	18 _35	36 _45	46_55	56_65	Above 65	Total
Masimba	39	45	41	14	4	1	3	147
Maskati	22	47	36	8	9	1	4	127
Mndela	8	26	16	14	3	2	0	69
Msolokelo	17	36	27	10	7	6	6	109
Ndole	24	36	35	8	1	1	0	105
Total	**259**	**557**	**338**	**183**	**95**	**32**	**44**	**1508**
Percentage	**17%**	**37%**	**22%**	**12%**	**6%**	**2%**	**3%**	

Source: Field survey, 2018

Education level is a vital factor affecting the rate and scale to which new technologies can be copied. In terms of climate change resilience, education is also an important factor in determining the capacity to learn adaptive measures (see Figure 1). For this reason, education assessment is an important aspect before implementation of project activities that will need introduction of new skills and knowledge. The highest level of education attained by the majority of the household heads in the baseline survey was primary education (80%), 17% had no formal education and 2% had secondary education. In this survey the highest level of education attained by the majority of households remained primary education (87%), whilst 2% had secondary education and 9% of them have not attended any formal education. Bwage village was leading in having more educated participants as 16% of the respondents in Bwage had secondary education. Levels of education need to be considered when planning project activities. Table 5 below shows the education level of the respondents at the village level.

Table 5: Education level of respondents at the village level

Village	None	Incomplete primary	Primary	Secondary	College
Bwage	0	1	16	3	0
Diburuma	1	1	21	0	0
Difinga	3	2	24	1	0
Kanga	4	0	24	0	0
Kibatula	5	0	14	1	0
Kinda	1		14	0	0
Mafuta	0	0	21	0	0
Masimba	3	0	25	0	0
Maskati	0	0	20	1	0
Mndela	0	0	10	0	0
Msolokelo	4	0	17	0	0
Ndole	4	0	22	0	
Total	**25**	**4**	**229**	**6**	**0**
% Endline	**9**	**2**	**87**	**2**	**0**
% Baseline	**17**	**80***		**2**	**0**

**The baseline survey did not distinguish between incomplete and complete primary education.*
Source: Field survey, 2018

The baseline survey reported that there were 306 children within the 6-17 age groups in the visited households, of which 172 were attending school (95 boys and 77 girls) indicating 56% of the children in the surveyed households were attending school and 44% were not attending school. There were some changes in this survey where 369 (66%) pupils out of 557, attended schools of which 185 were boys and 184 were girls. Through the eco-schools component, the project has been working with schools to reduce school drop-out rates and to promote girls' education.

2.1.3. Ethnic composition

Regarding ethnic composition, during the baseline survey, the main tribes of the head of household interviwed were Nguu (46%) followed by Zigua (38%). Other tribes include Chagga (5%), Kaguru (3%) and Hehe (3%), whilst Nyakyusa, Pare and Masai, Barabaig and Sukuma comprise 1 % each (It was realised during KIIs that Nguu and Zigua people are similar in terms of language and customs). The results of this survey revealed the same as baseline where Nguu is still seen to be the main tribe of the project villages covering 53% of the respondents, followed by Zigua (29%). Other tribes like chagga (5%), Hehe (2%), Kaguru (2%) and other tribes such as Kuria, Pare, Byakusa, Bena, Kinga, Kwere contributes to the remaining percentage.

The baseline report showed that 59% of the respondents were born in the surveyed villages, and about 41% migrated in the village while this report indicated that 75% of the respondent were born in the village and 25 were migrants from other Tanzania region. Further analysis indicated that most of the people migrated into the village following villagilazation programme (*Ujamaa* programme) in 1970`s while others migrated in recent years in order to obtain farming and grazing lands. Table 6 shows distribution of tribes per village.

Table 6: Distribution of tribes per village

Tribe / Village	Nguu	Barabeig	Mbena	Chagga	Mhaya	Hehe	Mkaguru	Mkamba	Mkerewe	Mkinga	Kuria	Mkwere	Mluguru	Mgoni	Nyakusa	Nyamwezi	Pogoro	Muha	Zigua
Bwage	1	0	0	3	1	2	0	0	0	0	3	0	0	0	0	1	1	0	8
Diburuma	13	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	6
Difinga	14	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	13
Kanga	1	0	1	9	0	0	0	0	1	2	0	0	1	0	1	0	0	0	12
Kibatula	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16
Kinda	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Mafuta	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Masimba	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
Maskati	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mndela	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Msolokelo	8	0	1	0	0	0	3	1	0	0	0	0	1	0	0	1	0	1	5
Ndole	21	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0
Total	**139**	**2**	**2**	**12**	**1**	**6**	**8**	**1**	**2**	**2**	**3**	**0**	**3**	**1**	**1**	**3**	**1**	**1**	**76**
%	**53**	**1**	**1**	**5**	**0**	**2**	**3**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**29**

Source: Field survey, 2018

2.2. Land tenure

Land ownership in most rural areas is through inheritance, few people buy or rent land. Land tenure affects households' 'buffer capacity' in the context of climate change resilience. The 2014 baseline survey recorded that 95% of the respondents owned land as their own property. This survey found that 97% own land as their own property and 79% of the owners of the land were male while only 20 % were female and that 3% of households depend on rented land (although 11% of households rent land overall i.e. for 8% of households farm rented land in addition to farmland that they own). During the baseline report, it was reported that of those who owned land, nearly half (45%) had acquired it through inheritance from parents, 24% had purchased the land; 12% obtained their land from the village government and 19% obtained it freely from public land. While this survey revealed that 63% of the respondents had acquired their main land area through inheritance, 18% purchased it, 8% were granted it by villages, 6% free land acquisition and 5% rented. Table 7 shows the land ownership and Table 8 shows land acquisition per village. The KII revealed that the number

of people who acquired land through clearing the forested areas in the villages has been reduced because of the Village Land Use Plans and Village Forest management regulations. For example, in Kibatula village just a few years ago, people were able to clear forest to obtain new agricultural land but now they can not even sell the land without consulting village leaders. In contrast, in Difinga Village the land that was allocated for the Village Forest Reserve (Kibaka), has been encroached which is illegal because the land was allocated for other land uses and not for farming. Also, the KII revealed that villagers in only one village, Ndole had Certificates of Customary Right of Occupancy (CCRO). During the baseline none of the villages owned land based on that system. This has been facilitated by project through land use plan as an example for other villagers to use the same procedures to make sure that they all acquire CCROs. Despite the village having a system of acquiring land, none of the villages managed to show the land registration book at the village. The essence of this book is to help the village to know which piece of land is owned by whom.

Table 7: Land ownership per village

Village	Land owned as their properties	Rented
Bwage	19	1
Diburuma	23	0
Difinga	29	1
Kanga	26	2
Kibatula	20	0
Kinda	14	1
Mafuta	21	0
Masimba	28	0
Maskati	21	1
Mndela	10	0
Msolokelo	19	2
Ndole	25	1
Total	**255**	**9**

Source: Field survey, 2018

Table 8: Land acquisition per village level

Village	Purchased	Inherited	Granted by village	Free land acquisition	Rent
Bwage	10	8	1	0	1
Diburuma	1	20	2	0	0
Difinga	4	18	4	3	1
Kanga	4	13	6	3	2
Kibatula	3	8	2	6	1
Kinda	5	7	0	1	2
Mafuta	0	21	0	0	0
Masimba	7	15	4	2	0
Maskati	1	20	0	0	1
Mndela	0	10	0	0	0
Msolokelo	6	10	2	1	2
Ndole	6	16	1	1	2
Total	**47**	**166**	**22**	**17**	**12**
%	**18**	**63**	**8**	**6**	**5**

Source: Field survey, 2018

The baseline further revealed that the average size of land owned and used by households for permanent cultivation was 7.31 acres per household, whilst the total land area owned by the households (including for agroforestry, pasture, shifting cultivation, woodland but excluding land rented in) was 12.4 acres. At the endline survey revealed that the average area of land owned and used by the household for permanent cultivation has reduced to 3.9 acres whilst the total area owned by the households is now 5.4 acres. See Annex 1. This shows that both the area of land used for permanent agriculture by households, and the area of land owned by households has reduced by 43% and 56% respectively.

2.3. Assets

2.3.1 Houses

The materials used to build a house are one of the wealth indicators which were used to assess the wealth of the respondents before and after joining the project. The materials used to build the houses were categorized into three categories: modern, traditional and mixed. Modern materials are defined as cement/cement blocks and iron sheets. Traditional materials are mud and thatch. Mixed materials refer to any combination of modern and traditional material (Lyimo, 2018). The survey revealed four main types of house in the landscape, mud wall with thatched roof (23.9%), mud wall with iron sheet roof (20.8%), burnt brick wall with iron sheet roof (46.6%) and thatched walls with thatch roof (7.6%). This endline survey has found that of the households that were interviewed, burnt bricks walls with iron sheet roof covered (47%), own grass thatched houses with mud wall covered (64 %), timber walls with iron sheet covered (1%), thatches wall with thatches roof covered (8%) and 21% was for corrugated roofs with mud wall houses.

Table 9: Type of houses per village level

	Modern		Mixed materials		Traditional		
Village	**Burnt brick walls with iron sheet roof**	**Cement block and iron sheet**	**Timber or thatch wall with iron sheet**	**Mud walls with iron sheet**	**Mud wall with thatched roof**	**Thatches wall with thatched roof**	**Timber wall or unburnt brick wall with thatched roof**
Bwage	12	0	1	1	3	3	0
Diburuma	8	0	0	4	11	0	0
Difinga	11	0	0	13	6	0	0
Kanga	13	0	1	6	3	5	1
Kibatula	0	0	1	2	6	11	0
Kinda	9	0	0	5	1	0	0
Mafuta	19	0	0	2	0	0	0
Masimba	10	0	0	6	12	0	0
Maskati	14	0	0	4	4	0	0
Mndela	7	0	0	3	0	0	0
Msolokelo	4	0	0	6	10	1	0
Ndole	16	0	0	3	7	0	0
Total	**123**	**0**	**2**	**55**	**63**	**20**	**1**
Endline %	**46.6**	**0**	**0.8**	**20.8**	**23.9**	**7.6**	**0.4**
Baseline %	**33**	**1**	**1**	**13**	**36**	**15**	**2**

Source: Field survey, 2013 and 2018

The survey revealed four main types of house in the landscape, mud wall with thatched roof (33%), mud wall with iron sheet roof (18%), burnt brick wall with iron sheet roof (30%) and cement block wall and iron sheet roof (13%). Overall there has been little change in the proportion of houses with modern (43% in 2013, 47% in 2018), mixed (18% in 2013, 21.6% in 2018) and tradtional (47% in 2013, 31.9% in 2018) housing materials.

2.3.2 Other assets

The endline survey found that 80% of households have one or more physical asset (see Table 11 for list of items considered as assets), and 20% have 0 assets. This compares with the baseline where 84% of households had one or more physical asset and 16% have 0 assets (see Table 10). In 2013, the average number of assets per households was 2.2 whilst in 2018 it was 1.7.

Table 10. Number of assets owned per household at baseline and endline

Number of Assets owned per household	Endline 2018 n=264	Baseline 2013 n=200
0 assets	20%	16%
1 asset	33%	20%
2 assets	22%	24%
3 assets	9%	21%
4 assets	9%	9%
5 assets	2%	7%
6 assets	2%	1%
7 assets	0%	1%
More than 7 assets	1%	2%

Overall there has been an increase in the ownership of solar power units whilst ownership rates of mobile phones and motorbikes have remained constant. Ownership rates of radios and bicycles have declined between 2013 and 2018.

Table 11: Rate of ownership of different assets at baseline and endline

Assets	Endline 2018 n=264	Baseline 2013 n=200
Radio	18.11%	59.5%
Mobile phone	53.79%	50.5%
Bicycle	23.68%	44.5%
Motorbike	12.73%	13.5%
Solar power	30.11%	9.0%
Car	0	2.0%
TV	1.48%	1.0%
Tractor	0	0.5%
Plough	2.24%	No data
Water pump	1.11%	No data
Generator	0.37%	No data
Maize mill	0.37%	No data

Table 12. % of households per village with 0 assets

Village	% HH owning 0 assets in 2018 n=264	% HH owning 0 assets in 2013 n=200
Maskati	41%	55%
Ndole	35%	19%
Msolokelo	33%	57%
Masimba	32%	11%
Kibatula	25%	No data
Kanga	21%	4%
Difinga	20%	17%

Village	% HH owning 0 assets in 2018 n=264	% HH owning 0 assets in 2013 n=200
Diburuma	13%	No data
Kinda	7%	20%
Mafuta	5%	No data
Bwage	0%	0%
Mndela	0%	0%
Overall	**20%**	**16%**

2.4. Drinking water and sanitation

The baseline report indicated that the households obtain water from various sources such as piped water (e.g. stand pipes), surface water, open and covered wells and natural springs. It was noted that 65% of the respondent households do not have access to piped water. This endline survey found the same results where (65%) of the respondent households do not have access to piped water. This shows that access to piped water remains a problem in the surveyed villages. The surveys also showed that the % of households depending on streams for their water has increased from 25% at the baseline to 34% at the endline, whilst access to covered wells has reduced from 15% to 7% between 2013 and 2018. The increased use of streams, reflects the inclusion of Mafuta and Kibatula Villages in the endline survey (but not in the baseline). 100% and 45% of households interviewed in Mafuta and Kibatula Villages respectively rely on streams for their water. Water sources are outlined below:

Table 13: Main water source for households at baseline and endline

Main Water Source	% of HH at Endline 2018 n=264	% of HH at Baseline 2013 n=200
Stream	34.34%	25.12%
Unprotected springs	4.91%	11.59%
Open wells	18.11%	13.04%
Closed wells	7.17%	15.46%
Piped water	35.47%	34.78%
Rainwater	0%	0%
Total	**100%**	**100%**

The mean walking time for fetching water is 16 minutes, compared with 23 minutes the baseline. The endline survey shows that 72% of households take less than 15 minutes to collect water (23% take < 5 minutes), whilst 20% take more than 30 minutes. For households distant from a water point, water collection is a significant cost, either in terms of purchasing water (TZS 1,000 – TZS 1,500 per bucket) or the cost in terms of time away from other economic activities.

Table 14: Time taken to collect water at baseline and endline

Time to reach water collection point	Endline 2018	Baseline 2013
<15	72.45%	70.59%
15-30	15.47%	8.82%
>=30	12.08%	20.59%

By 2018, the villages with the greatest distances to their water points include Kanga, Kibatula and Masimba. Access to water had improved in Difinga, Bwage and Masimba between 2013 and 2018, although the situation in Kanga had deteriorated. Respondents mentioned that in Masimba Village, protecting their water source has been a key motivation for engaging in CBFM.

Table 15: Average time to collect water at baseline and endline

Village	Average time taken to collect water (minutes) Endline 2018	Average time taken to collect water (minutes) Baseline 2013
Kanga	21.32	12
Kibatula	20.95	No data
Masimba	19.18	108
Msolokelo	11.05	12
Bwage	10.15	16
Kinda	8.67	5
Maskati	8.14	8
Ndole	7.85	8
Diburuma	6.70	No data
Mndela	6.50	6
Mafuta	6.24	No data
Difinga	5.77	16
Mean	**16**	**23**

The percentage of households who stated that water was available throughout the year declined from 73% to 62% between the baseline and endline surveys. 37% of those who experienced water shortages were from households otherwise dependent on piped water, whilst 31% were from households dependent on streams and surface water.

In terms of sanitation, of the surveyed households 99% of households use pit latrines, either their own pit latrine per household (91%) or a shared pit latrine (9%) whilst 1% using open areas or bush land. Whilst the percentage of households using pit latrines has not changed significantly since the baseline (97% in 2013, 99% in 2018), the % of households with their own pit latrine has increased from 60% to 91% since 2013.

2.5. Access to energy sources

The baseline survey in 2013 found that 100% of interviewed households use fire wood while 22% also use charcoal for cooking purposes. The baseline indicated that the average consumption of firewood per households was about three bundles per week. One bundle was estimated to weigh between 15 kg and 20 kg. For charcoal, one household was estimated to use one bag (60kg) per month. This survey found that 100% of the respondents use firewood, 8% uses both charcoal and firewood. In both baseline and endline It was also found out that 100% of the households that were surveyed were using open fire stoves known as “three stones.” This type of stove causes high loss of energy and consumes more firewood. The KIIs also noted that women were responsible for firewood collection while men make charcoal. According to KII the number of households who have been trained and have improved stoves were 88 households from Ndole, 6 from Kibatula, 6 from Bwage and 3 households from Ndole village. According to the village leaders, the stoves are good but the rate of spread per all villages is very limited. In accordance to the project activity reports of 2015 and 2017 indicated that 308 people, 214 women and 93 men were trained and constructed improved stoves.

The main sources of lighting in the village during the baseline report were lamps (Koroboi and Chemli) which use Kerosene (77%). While others use battery torch (14%), bulb connected to individual generator (8%) and bulb connected to public electricity supply (1%). This pattern is very common in rural areas of Tanzania. The endline survey showed a significant change. The proportion relying on kerosene has declined from 73% to 23%, whilst the proportion relying on solar and battery-operated lights / torches have both increased, in the case of solar from 8% to 35%, and for battery powered torches from 14% to 42%.

2.6.Land use plan

This relates to the project's target that CBFM be established for 11,989 ha with management being implemented by mandated village institutions by end of year 5. In 2013, none of the villages surveyed had Village Land Use Plans. However, villagers were using their land for various purposes such as settlement, agriculture, grazing and institutions. Lack of land use plans can create land use conflicts as reported earlier that there some observed conflict between the Maasai pastoralists and farmers in the surveyed villages. The endline survey revealed that 8 of the villages included in the survey have land use plan (Masimba, Msolokelo, Ndole, Difinga, Diburuma, Bwage, Kibatula and Mafuta). 4 villages got support from AVA project while the other 4 villages were supported by National Land Use Planning Commission. 100% of the respondents in the endline survey from villages with VLUPs stated that they comply with their village land use plan.

2.7. Household income

2.7.1. Conservation Agriculture (CA)

This relates to the project's target that At least 40 farmers per village in 31 villages have adopted climate-smart / conservation agricultural techniques including agroforestry as a result of capacity building provided by the project.

To gauge the level of awareness of CA, respondents were asked if they had heard the word "Conservation Agriculture". During the baseline 34% of the respondents stated that they were aware of the term conservation agriculture and 35% of those who were aware managed to describe the concept. The endline survey found that 41% were aware and 57% of the respondents who were aware, could describe the concept of the CA.

Overall the proportion of household heads who stated that self-employed agricultural production is the main economic activity has remained consistently high at 94% in 2013 and 99% in 2018.

2.7.1.1. Training on conservation agriculture (CA)

Villagers were also asked if they had been trained on CA. The results of the baseline revealed that 6% had been trained on CA. A similar impression was evident based on KIIs findings. This indicates that there has been little previous training on CA in the area. In this endline survey the results showed that 40% of the respondents either attended FFS or learned about CA through cinema and TV programme. The KII revealed that there were more than 40 farmers who have been trained from 11 villages except one village (Mndela) where no CA training was provided by the project (CA training was provided in 32 out of 40 villages involved at some stage in the project).

2.7.1.2. Adoption of conservation agriculture

During the baseline, of those who had heard of CA, 32% had adopted the CA practices. The endline survey showed an increase in the percentage of households who adopted CA whereby 47% of the people adopted and were aware of the CA (Table 13). The most widely adopted techniques were minimum tillage and cover crops.

Table 16: Awareness and adoption of CA per village level in the endline survey

Village	Number of HH aware of CA	Number of HH not aware	Number of HH adopted CA
Bwage	9	11	3
Diburuma	13	10	12
Difinga	12	18	11
Kanga	9	19	6
Kibatula	13	7	3
Kinda	7	8	5
Mafuta	2	19	0
Masimba	18	10	5
Maskati	6	16	2
Mndela	0	10	0

Village	Number of HH aware of CA	Number of HH not aware	Number of HH adopted CA
Msolokelo	3	18	1
Ndole	15	11	2
Total	**107**	**157**	**50**
%	**41**	**59**	**47**

Source: Field survey, 2018

Table 17: CA techniques adopted

CA techniques adopted	Number of farmers adopting the techique	Percentage % of farmers
Minimum tillage	21	42
Cover crops	10	20
Rotation crops	9	18
Multching	7	14
Herbicides	1	2
Agroforestry	1	2
Contour	1	2

Source: Field survey, 2018

2.7.1.3. Farming preparation methods

Farm preparation methods are important in defining land productivity. Poor farm preparation methods that involve use of fire, slashing and burning, planting without clearing farm among the other methods, lead to loss of soil fertility and hence poor land productivity.

The survey assessed the degree to which farmers prepare their farms in accordance with CA principles. This helps to assess the degree to which the basic principles of CA are being applied. The baseline survey found that 48% did not slash or burn during farm preparation but they used a hand hoe or plough only. The endline indicated that the number of people practicing burning in their farms decreased from 34% to 9% since the baseline (Table 18), whilst the number practicing slashing only increased from 18% to 27%. The % of households practicing slashing and / or burning has reduced from 52% to 36%.

Table 18: Farming preparation methods used by farmers at the project

Farm preparation methods	% HH Endline (n = 264)	% Baseline (n = 200)
Slashing and burning	8	25
Burning only	1	9
Slashing and leaving debris to decay – no burning	27	18
Using hand hoe	60	64
Ploughing	2	3
Pit	2	
Tractor	1	

Source: Field survey, 2018

2.7.1.4 Support for farmers

During the baseline found that no external support was provided to the farmers to improve or to adopt conservation agriculture. While this survey found that 21% of the respondents have received support from AVA project either through training or agricultural inputs such as seeds and fertilizers. Respondents also reported that they had received training on marketing and business skills from the project. It was also stated by many farmers from Kinda, Masimba, Kanga and Kibatula that the interaction between ward/village agriculture officers has increased compare to before the AVA project.

2.7.1.5. Crops grown in the landscape

The baseline survey showed that 91% of households grew maize. Beans were the next most commonly grown crop with 34% of households cultivating beans, mostly in Maskati, Kinda, Masimba and Ndole.

2.7.1.6. Crop yield

According to the KIIs and household interviews, the yield of the major crops during first season (January to July) was higher compared to the yield during the second season (October to December). In the first season the yields of most crops were high ranging from 5 sacks/acre for beans to 9 sacks /acre for maize (estimated that 1 sack is equivalent to 120 kg). For the farmers who practice conservation agriculture in lowland harvest 8 to 16 bags of maize per acre while in highland harvest 6-12 per acre.

2.7.1.7. Crop production constraints

In the baseline survey it has been reported that one of the major crop production constraints were infrequent visits from agricultural extension officers (20%).

Other constraints that were mentioned include shortage of agriculture tools unpredictable weather patterns possibly due to climate change. It was noted that farmers still have market problem especially when they harvest huge of crops. All farmers (100%) complained about access to market. Most of the crops harvested in the project area are sold to middle men at the village at a low price. Also 85% of respondents complained about crop-raiding by wild animals like baboons, rats, vervet monkeys, wild pig and birds.

2.7.1.8. Household income from farming

As reported in the baseline survey, most respondents are involved in small-scale agriculture. The baseline survey reported two seasons in the landscape and the main crops were maize, beans, banana, rice, pigeon peas, groundnuts and vegetables. The income from agriculture differs from one season to another. The baseline survey results found that villagers were most dependent on maize as a source of income and food. The average incomes were TZS 260,000 TZS per season in 2013 (~US$ 161 @ the 2013 rate of US$ 1: TZS 1615) while this survey (2018) showed that average incomes were TZS 372,898 per season (~US$ 163 @ the 2018 rate of US$ 1 : TZS 2282). When taking into consideration inflation over that period, US$ 161 in 2013, is equivalent to US$ 174 in 2018. This indicates that the real value of farmers' incomes has declined. In part, this seems to be linked to tighter export controls, which have contributed to a 50% drop in the price of maize in Tanzania between early 2017 and early 2018. Farmers complained that they only received TZS 290 per kg during the last season. Thus, despite increased yields, incomes did not increase correspondingly.

2.8. Livestock keeping

The endline survey found that 70% of respondents keep livestock compared with 74% in the baseline. The most commonly kept livestock are poultry (54% of households) (Table 19). This is less than in the baseline when 68% of households reported keeping poultry. The average number of livestock owned by households is 11 animals ranging from 0 to 200, although only three households have more than 70 animals (2 househods with > 150 cattle, 1 household with 150 poultry). Mean number of livestock has remained almost the same since the baseline when it was 11.7 animals / household. The survey showed that some poultry keepers have been trained by the AVA project on how to keep chickens in an improved way. KII showed that Bwage, Kibatula, Kanga and Kinda Villages have 20 farmers per village, trained in improved poultry-keeping by the AVA project.

Table 19: Type of livestock keeping in the project village at baseline and endline

Type of livestock	% of respondents with one or more livestock at endline 2018 n = 264	% of respondents with one or more livestock baseline 2013 n=200
Cattle	10	11
Goat/sheep	18	28
Pig	18	14

Type of livestock	% of respondents with one or more livestock at endline 2018 n = 264	% of respondents with one or more livestock baseline 2013 n=200
Poultry	54	68
Livestock ownership overall	**70**	**74**

Source: Field surveys, 2013 and 2018

2.8.1 Income from livestock

The mean household income (across all households) from livestock at the baseline in 2013 was TZS 156,815, ranging from TZS 0 to TZS 7,939,000 (this outlier was primarily from the sale of cattle). 41 % of households at the baseline earned an income from the sale of livestock. In contrast at the endline, the mean annual income from livestock was TZS 49,000 (across all households), ranging from TZS 0 to TZS 1,440,000, with 14% of households earning an income from livestock. The reason for the decline in the number of households benefiting from livestock sales, and in the income per household is not clear since overall livestock ownership had not changed significantly between 2013 and 2018. At the project baseline in 2013, in terms of the sale of animal products, 12% of households earned an income from the sale of animal products including milk, animal hides and eggs. The average annual income from animal products for those households was TZS 107,254 ranging from TZS 1,277,500 to TZS 100. The highest earning households were those selling milk. In contrast, only 3% of households stated that they had earned an income from animal products at the endline. The average annual income from animal products for those households was TZS 445,000 ranging from TZS 20,000 to TZS 1,800,000. The decline in livestock incomes between 2013 and 2018 contrasts with the the consistent ownership patterns between the baseline and endline. This suggest that households are holding on to their livestock and animal products rather than selling them. This pattern was not detected at the time of the survey field work and so was not investigated further.

2.9. Uses of forest products

7,000 households derive an increased share of their total income from sustainable use and management of natural resources

KIIs and interviews reported that timber harvesting activities carried out in Kanga Forest Reserve and Mkingu Nature Reserve have decreased due to the presence of VNRCs, joint patrols and MJUMITA local networks who have reported several incidents to the TFS (Kanga and Mkingu).

During the household, survey seven households reported that they were involved in charcoal in the sustainable charcoal programme. No other respondents stated that they were involveed in charcoal production. This is likely to reflect concern at being implicated in illegal harvesting and therefore cannot be considered as a reliable result.

100% of the respondents who practice sustainable charcoal stated that they obey Village Forest management bylaws and the baseline found that 29% of the villagers who harvest forest resources did follow the village regulations. Due to the key informant discussion in 4 villages which have already set up sustainable forest management, Village forest Reserve and its regulations has realized the rate of people who come to ask permit for forest resource is high to compare before and after the AVA project. The VNRC leaders mentioned that harvesting fees and fines are one of the benefits derived from the village forest reserve. For example, in Ndole village, they earned more than TZS 5 million from fines whilst Masimba earned > TZS 2 million and Msolokelo generated TZS 820,00 from sustainable charcoal revenue. So, there is a dramatic change in the use of forest resources after the project intervention. To verify this statement if it is accurate, you can look at some of the project's villages that are under JFM and CBFM, in JFM villages income from forest is not tangible like the CBFM villages.

None of the JFM villages in the survey reported that they hads received funds from TFS as part of benefit sharing.

2.9. Beekeeping

At least 3000 households show an increase in incomes and resilience to climate change through new natural-resource enterprises / inome generating projects, or existing enterprises that experience an increase in profitability by end of Year 5.

2.9.1. Beekeeping practices

Beekeeping is one of the alternative income generating activities that was supported by the AVA project. The project supported 138 beekeepers (48 women, 90 men) in groups in three project villages (Bwage, Kanga and Digoma). Support included training, equipment and regular backstopping visits. The training was done in collaboration with the Mvomero District beekeeping officer and project staff.

The 2013 baseline survey found that 6% of households practiced beekeeping including some beekeepers supported by the PEMA and AVA projects (Lyimo E, 2014). The endline survey found that 3% households practice beekeeping (Table 20). Overall, beekeeping has not taken off as a significant IGA in the landscape although three of the villages with households practicing beekeeping were villages that had not been supported by the project (Kibatula, masimba and Maskati).

Table 20: Household practice beekeeping per village level

Village	No. of HH practice beekeeping
Bwage	0
Diburuma	0
Difinga	0
Kanga	5
Kibatula	1
Kinda	0
Mafuta	0
Masimba	1
Maskati	2
Mndela	0
Msolokelo	0
Ndole	0
Total	9 (3%)

Source: Field survey, 2018

Table 21: Village and group supported per village

Group name	village	No. of HH	Men	Women
Ujamaa Lukindu	Kanga	10	5	5
KAECO	Kanga	21	13	8
Upendo	Kanga	11	5	6
Tumaini Jema	Kanga	28	14	14
Zinduka	Bwage	11	8	3
Muungano	Bwage	15	10	5
Total	**2**	**96**	**55**	**41**

Source: Field survey, 2018

2.9.2. Beekeeping Training

The 2018 survey also interviewed the beekeeping groups in all the survey villages. This survey has found that 7 (78%) of the interviewed have received training and supports from the project while 2 (22%) reported that they have not received the training.

2.9.3. Accessibility of market for honey

According to this survey, the availability of market for honey is high, (100%) of the honey produced in the studied area were sold locally. The price of the locally packed honey was 10,000/= shillings per litre. This indicates that there is good market for honey in the surveyed area.

2.9.4. Income from beekeeping

In the baseline survey (2014), 12 (6%) households earned an income from beekeeping. The mean annual income was TZS 357,000 with a range from TZS 20,000 to TZS 2,000,000. By 2018, the mean annual income was TZS 361,000 ranging from TZS 100,000 to TZS 600,000, with 3% of households practicing beekeeping. Given inflation over the intervening period, this suggests an overall decline in the real value of the income from beekeeping.

2.10. Allanblackia nut trade

Allanblackia nut trade is one of the alternative income generating activities that the project has supported communities to engage in. Support for the trade is linked to the project's strategy of promting livelihood diversification as a way of enhancing resilience to climate change. Households in 5 villages: Mafuta, Msolokelo, Kinda, Maskati and Mndela reported incomes from the Allanblackia nut trade. Household survey revealed that 11 (4%) of the 264 surveyed households were involved in this business (Table 22). During the baseline survey none of the households reported revenues from nut collection. KII results from five village found that 66 Household members were involved in nut collection (Table 20). The AB collectors group members from the above village explained that TFCG through AVA project facilitated group formation, training related to business and rules of collecting AB nuts in the forest Reserves. Other trainings were on proper drying and packaging techniques.

Apart from that, AVA project also conversed buyer to initiate new collecting centre in five villages namely Makate, Kinda, Maskati, Msolokelo and Digalama. Moreover, the KII revealed that AVA project mobilized AB collectors to contribute 3000/=TZS per year for VNRC and 3000/=TSZ for AB nut collectors network. The fund for VNRC is used for managements of the forest especially during the patrol while the fund for network is used for facilitating meetings between buyers and collectors. The network now is facilitating the registration and opening of baking account.

Table 22: Number of households involved in AB trade per village

Village	No of surveyed HH involved in the AB trade
Bwage	0
Diburuma	0
Difinga	0
Kanga	0
Kibatula	0
Kinda	0
Mafuta	6
Masimba	0
Maskati	0
Mndela	2
Msolokelo	3
Ndole	0
Total	**11 (4% of surveyed HH)**

Source: Field survey, 2018

Table 23: Number of HH involved in AB nut trade per village according to KII

S/N	Village	No. of HH	Women	Men
1	Mafuta	11	8	3
2	Kinda	11	4	7
3	Mndela	14	4	10
4	Maskati	26	9	17
5	Msolokelo	4	1	3
Total		**66**	**26**	**40**

Source: Field survey, 2018

2.10.1. Income from Allanblackia

This survey report indicated that all 11 (100%) household involved in AB nut trade in surveyed villages earned income. The mean annual income for those household engaged in the AB trade was TZS 370,000, ranging from TZS 234,000 to TZS 600,000.

2.11. Village Saving and Loan Association (VSLA)

This links to the project's targets that:
SO Target 4: 2,500 people of whom at least one third are women are saving and borrowing in registered and functional VSLAs by end of Year 5; and
ER 3 Target 1: There are 150 VSLAs functioning effectively with the active involvement of women in 31 vilalges.

Access to the communities to get loans and financial services such as saving accounts is very limited throughout the country particularly in poor rural communities. The AVA project assisted women and men in 30 villages in the South Nguru landscape to engage in Village Savings Loan Associations (VSLA). This is a microfinance model appropriate in communities that cannot access other more commercial microfinance services such as banks or microfinance institutions. Participating in VSLAs also comprises a strategy to enhance climate change resilience in terms of increasing buffer capacity and self organisation (see Figure 1).

The Village Savings and Loans Association model is a community-based, group savings and loan methodology. A self-selected group of 30 people pool their money into a fund from which members can take loans. The capital is generated through the purchase of shares (values of shares are agreed by the group members) on a weekly basis with a limit of 3 to 5 shares per person per week. Members can borrow three times the value of their accumulated savings. Members fix the interest rate (ranging from 3% to 5%). The maximum loan period is 3 months and principal is paid at the end of period. In addition to share purchases, members contribute to a social fund that is used to support members in times of need. The support received from the social fund is not paid back to the group. By the end of the cycle (usually one year), a dividend is distributed to all members based on share contributions.

According to project reports and monitoring data, the project supported 173 groups from 30 villages with 3982 members (2399 women, 1583 men). The baseline (2013) survey found that 43% of the villages had active VSLAs. During this endline survey (2018), 83% of the surveyed villages had active VSLA groups. 17% of the households that were surveyed in 2018 reported that they were involved in VSLAs compared with 32% in the baseline survey in 2013. KII results revealed that numbers of training have been conducted and closely monitoring and follow up of the groups.

Table 24: Number of respondents currently involved in VSLA

Village	Number of surveyed HH who are VSLA members in 2018

Village	Number of surveyed HH who are VSLA members in 2018
Bwage	4
Diburuma	0
Difinga	10
Kanga	7
Kibatula	1
Kinda	8
Mafuta	0
Masimba	3
Maskati	4
Mndela	0
Msolokelo	2
Ndole	6
Total	**45**

Source: Field survey, 2018

2.11.1. Training provided to VSLA

The endline survey found that 52% of the respondents who were involved in VSLAs had received training directly from the project on topics such as business and entrepreneurship skills, financial management, training CBTs on VSLA operation.

2.12. Eco tourism

When asked whether there is any eco-tourism in their village, three respondents from Kanga Village, reported that there was eco-tourism in their village but that they did not earn anything from it. All other respondents stated that there was no eco-tourism in their village.

2.13. Tree planting

The endline survey found that 20% of households were involved in tree planting / silviculture, with 16% of households practising inter-cropping trees on their farms. 6% of households said that they were practising tree planting as a result of support from the AVA project. The most popular kinds of trees planted were fruit trees (14% of HH), teak (6% of HH) and Grevillea robusta (4% of HH). This is similar to the baseline conditions where 21% of households were involved in tree planting with 12% planting fruit trees, 18% planting teak and 2% planting Grevillea.

2.14. Perception of household to the wellbeing in the past two years

The 2013 baseline survey found that 57% of heads of households considered that their income was not sufficient to meet their basic needs, compared with 36% in 2018. This is despite the apparent decline in agricultural incomes.

Meet basic needs	Endline n=264	Baseline n=200
Yes	20%	39%
Just about	44%	5%
No	36%	57%

Furthermore, in 2014 the respondents were asked to compare general wellbeing over the past two years between 2012 and 2014. The results indicated that 43% of households considered that their situation in 2014 was better than in 2012. In contrast, in 2018 only 14% of households considered themselves to be better off than in 2016, whilst the majority (71%) considered that their situation had not changed (Table 25).

Table 25. Perception of status relative to the past at the baseline and endline

Perceived status relative to the past	Endline	Baseline
Better off	14%	43%
The same	71%	28%
Worse	16%	30%

Amongst those households who considered that they were better off, the majority attributed it to changes in agriculture (62% and 86% respectively at the baseline and endline). At the endline, 8% of those households who considered themselves to be better off attributed their improved situation to Allanblackia incomes.

3. Discussion

The endline survey provides snapshot of household livelihoods in the South Nguru landscape in 2018. The survey also provides an opportunity to detect changes since the baseline survey in 2013, and to identify differences between villages in the landscape. By comparing project interventions with the changes detected in people's livelihoods, we can also examine the degree to which the project has contributed to those changes.

Overall, much has remained the same in South Nguru villages over the lifespan of the project despite overall economic growth of 6% - 8% of GDP per year for Tanzania as a whole.

In order to consider changes in the context of climate change resilience, we have looked at key variables relevant to the CC resilience framework proposed by Speranza *et al*. 2014 (see Figure 1). These are summarised in Table 26.

Buffer capacity

Human capital

Of the four variables measuring changes in human capital, two remained and same while two showed a positive change.

The proportion of household heads with at least some primary education has remained roughly the same, Similarly, levels of secondary education in household heads remains at around 2%. There is a small increase in the proportion of children remaining in school.

There is a detectable change in the proportion of households aware of climate-smart, conservation agriculture techniques. This reflects a positive change that the project has contributed to through its support for farmers in 31 villages. Given that 99% of households stated that agriculture is their main economic activity, this is a significant positive change, particularly in the context of climate change. 6% of households interviewed in the endline survey stated that 'good yields' were a key benefit of the agricultural techniques promoted by the project.

Natural capital

In terms of natural capital, the average size of household land-holdings appears to have halved between 2013 and 2018. There are a number of factors that could have contributed to this including increasing populations, and stricter controls on land use. In terms of whether it can be attributed to stricter controls on land use, the reduction also occurred in two of the three villages that had not developed village land use plans and CBFM. For example, in Maskati, the area of land under permanent agriculture per household halved between 2013 and 2018, whilst in Mndela it declined by 41%. This Is an area of change which requires further investigation.

In terms of access to forest resources, the establishment of village forest reserves, improves households access to forest products in these villages, and so is considered a positive change.

Financial capital

Of the nine financial capital variables considered in the survey, one showed a small positive change between 2013 and 2018 (income per HH from sales of animal products), three variables (all related to asset ownership) showed no significant change, and four variables indicated a negative trend, of which three relate to incomes.The decline in household incomes was also reflected in people's perceptions of their current well-being with 8% of households stating that they felt worse off now than 2 years ago primarily due to low incomes. The apparent decline in household incomes is of particular concern in the context of climate change resilience.

Physical capacity

Of the physical capital variables, two showed positive changes and one showed a negative change. Positive changes were observed in housing condition, with more households now using modern building materials including corrugated iron roofs; and having easier access to water supplies. However, the proportion of households with access to protected water supplies (piped water or covered wells) has declined. This is concerning given the links between health and water quality.

Self organization

In the context of self-organisation, two variables were included in the survey. Of these one variable, VSLA membership showed a decline since 2013, while there was a positive change in the number of villages will village land use plans. The improved village land governance is directly linked to the project, which has directly supported 7 villages to adopt village land use plans. The apparent decline in the proportion of households involved in VSLAs is surprising given the increase in the number of VSLAs in the landscape, and the increased overall membership. It is possible that this reflects the overall population growth, thus whilst the number of people involved in VSLAs has increased, given population growth, the proportion may have declined.

Capacity for learning

The survey measured five variables related to capacity for learning. Of these, all showed positive changes including one variable showing a significant behavior change since the baseline whereby the proportion of households burning agricultural residues has declined from 34% to 9%. Whilst in other cases, there are clear signs of increased understanding of concepts including CBFM, JFM, climate change and climate change adaptation. Through widespread awareness raising, the project has contributed to these changes in awareness.

The capacity for learning is also reflected in the adoption of livelihood activities that were not present at the project baseline including sustainable charcoal production, Allanblackia nut collection and sustainable timber harvesting. The capacity to adopt new livelihood strategies is a strength in the context of climate change resilience.

Comparing the endline household survey with the results of the project's wealth ranking assessment for participants in project activities

Whilst this household survey selected respondents randomly regardless of whether or not household's participated in project activities, a separate assessment was conducted to look at the impact of the project on those directly involved in project activities. In comparing the results of the two surveys, a number of trends are apparent.

The project successfully targeted poorer households

Overall the households who participated in the project activities had less land (3.4 acres compared with the average in 2013 of 7.31 acres) and less livestock (9.6 animals vs an average of 11.7 animals recorded in the baseline survey),

The positive changes documented through the wealth ranking assessment (for those involved in the project IGAs was not due to an overall increase in household wealth and incomes across the landscape suggesting that, at least some of the positive change recorded for those households is attributable to the project interventions.

Participants in project IGAs increased their wealth, in terms of land holdings, asset ownership and livestock ownership at a time when, on average within the project villages, households' landholdings were declining and livestock and other asset-ownership had stagnated.

Table 26. Summary of change in climate change resilience variables between 2013 and 2018

Indicator of CC resilience		2013	2018	Positive change	No significant change	Negative change
Buffer Capacity						
Human Capital						
Level of education	% with at least some primary education	83%	87%		1	
	% with secondary education	1.99%	2.2%		1	
% children of school age in school	% of children 6 - 17 years in school	62.40%	66.25%	1		
% of HH heads with an understanding of climate-smart, conservation agriculture	% of households who could describe the key principles of conservation agriculture, and give examples of relevant practices.	35%	57%	1		
Natural Capital						
Average land area owned and under permanent cultivation	Acres of land available to a HH including land under permanent cultivation, shifting cultivation, agroforestry and private woodland	7.31	3.9			1
Total land holding per household	Acres of land available to a HH including land under permanent cultivation, shifting cultivation, agroforestry and private woodland	12.4	5.4			1
% villages with access to well-managed forest resources in a VLFR	% of HH in the survey with VLFRs providing well-governed access to forest products.	0%	67%	1		
Financial capital						
% Dependents	% of the household < 18 yrs and > 65 yrs	44%	57%			1
Productive assets						
Number of productive physical assets per household	Average number of assets including phones, bicycles, solar power units, radios, motorbikes	2.2	1.7		1	
% households with at least 1 productive asset	% households owning at least 1 of any of the following items: phone, radio, bicycle, solar power unit etc	84%	80%		1	
Livestock						

Indicator of CC resilience		2013	2018	Positive change	No significant change	Negative change
% households with at least 1 or more livestock	% households owning at least 1 chicken or sheep or pig or head of cattle.	74%	70%		1	
% households earning an income from the sale of livestock		41%	14%			1
Mean annual income from the sale of livestock	Income in TZS not adjusted for inflation	156,815	49,000			1
% households earning an income from the sale of animal products	% HH who stated that they earn an income from the sale of animal products such as milk, eggs, hides	14%	3%			1
Mean annual income from the sale of animal products	Mean annual income in TZS from the sale of animal products such as eggs, milk and hides, not adjusted for inflation.	107,000	445,000	1		
Crops						
Average income from the sale of agricultural crops	Mean annual income from the sale of agricultural crops. Note that this has not been adjusted for inflation. If adjusted for inflation it represents a decline in real value (see report for details).	260,000	372,000			1
Physical capital						
Housing condition	% of HH with modern or mixed housing materials (% modern)	48% (34%)	68.2% (46.6%)	1		
% HH with access to piped water or protected wells		50.24%	42.64%			1
Average time to collect water (minutes)		23	16	1		
Self Organisation						
Institutions						
% villages with village land use plans		0%	67%	1		
Cooperation and networks						
% HH with members in VSLAs		32%	17%			1

Indicator of CC resilience		2013	2018	Positive change	No significant change	Negative change
Capacity for Learning						
% of farmers who continue to practice burning of farm residues		34%	9%	1		
Knowledge of threats and opportunities						
% of HH heads who have heard of climate change		23%	36%	1		
% of HH heads who have heard of climate change adaptation		6%	16%	1		
% HH heads who have heard of community-based forest management		6%	35.60%	1		
% HH heads who have heard of jointforest management		6%	35.90%	1		
Total				**12**	**5**	**9**

4. Conclusions

Overall the survey has shown that communities in the South Nguru landscape remain dependent on agriculture, poor in terms of assets and incomes, and with limited access to basic services including clean water. Despite overall economic growth in Tanzania, there has been limited trickle down to these rural communities.

In terms of the distribution of poverty across the landscape, no clear pattern emerges. although Maskati, an upland village on the western edge of Mkingu, has the lowest rates of asset ownership, and Bwage a lowland village in the north-east of the landscape has highest rates of asset ownership and high rates of modern housing, it would be simplistic to attribute these differences simply to location, since this pattern of poor upland villages vs poor lowland villages is not consistent.

Although the households included in this survey were randomly selected with no bias towards households that had been involved in the project, the survey detected the impact of the project in the lives of many of the respondents including through their participation in training events on forest management and livelihood activities; through increased knowledge on issues central to the project including participatory forest management and climate change; and through the adoption of livelihood activities new to the landscape including Allanblackia nut collection and sustainable charcoal. This indicates that the project has reached a significant proportion of the population of the landscape either directly through participation in project activities, or indirectly through learning from those trained by the project or through changes to the governance institutions operating at village level. Comparing the results of this household survey with the wealth ranking assessment that specifically looked at the impact on the livelihoods of those involved in project activities, we can be confident that the positive changes detected in the lives of those involved in project activities can be attributed to the project's interventions, given an overall stagnation in livelihood status across the landscape. This is also reflected in the attitude of the respondents in this survey where 87% felt that their livelihoods were the same (71%) or worse off (16%) than two years ago, compared with the relative optimism in 2013 when 43% felt that they were better off then than two years previously.

5. Recommendations

a) General recommendation

Generally, the project has had a positive influence on improving livelihoods; establishing Village Forest Reserves; and building local government capacity. There is a need to scale-up some of these interventions to benefit more households and communities within the South Nguru landscape.

The District should consider supporting the activities which have been initiated by AVA project and helping the villages to generate income from forest resources. In particular, we recommend further support for sustainable natural resources management including helping communites to practice sustainable charcoal production; increasing adoption of conservation agriculture; and identifying more IGAs where the farmers can generate more income.

b) Specific recommendations

1. Conservation Agriculture, Villages should set regulation at the village level that every members of the village should practice at least two principle of CA. this will contribute in increase of yield and lead to reduce level of poverty and enhance environment conservation.

2. District should emphasise the implementation of CA principles and Agriculture extension officers should evaluate based on the number of farmers who have adopted the CA.

3. The farmer field schools need to be strengthened to make them self-reliant, improve more access to conservation agriculture tools.

4. Awareness should be increased to other villagers who have no/little knowledge regarding conservation agriculture.

5. Farmers need to be linked to advocacy networks such as MVIWATA in order that they can influence policy decisions that affect the price of crops.

6. The Head of the Agriculture Department should establish a system to monitor the uptake of climate-smart, conservation agriculture.

7. More effort is needed to help the CBFM villages to improve their forest management and help them to generate income from sustainable forest harvest from Charcoal and Timber. Although the harvesting still in the early stages, but villages show positive interest on that. So it's a task of District to help these villages to continue on where the project ended.

8. Allanblackia network should be connected with other areas in Tanzania like Amani Nature Reserve where is same business like Mkingu so that can enhance the conservation and the nut business. The survey recommends MJUMITA network to link the AB members to MJUMITA local network.

9. Department of community Development should make close follow up to AB network to ensure that is registered, opening Bank Account and conducting regular meeting as it is in their constitution. This is importance since the network is still young.

10. Farms are the major source of fuel wood; there is a need to encourage farmers to plant more trees as many as possible. Moreover, campaigns on efficient fuel wood stove so as to reduce the rate of fuel wood consumption in the survey areas particularly the highland villages is need as many of them still depend on firewood.

11. Ward Community Development Officers should be make close follow up for VSLA network and cooperating with Community Based Trainers CBT to make sure that the network are continuing making monthly meeting.

6. References

Lyimo, E. 2014, The Adding Value to the Arc Project: a baseline household livelihood survey. TFCG Monitoring Report. Pp 1-52

Lyimo, E. 2018, The Adding Value to the Arc Project: Assessment of changes in the wealth of project beneficiaries over the project lifespan. TFCG Monitoring Report. Pp 1-21.

Speranza, I. C., U. Wisemann and S. Rist 2014. An indicator framework for assessing livelihood resilience in the context of social-ecological dynamics. Global Environmental Change 28: 109-119.

4.Annex

Annex 1.Type of land and average land used per household per village

S/N	Type of land	Type of ownership	Bwage	Diburuma	Difinga	Kanga	Kibatula	Kinda	Mafuta	Masimba	Maskati	Mndela	Msolokelo	Ndole	All Endline	All Baseline
1	Land used for shifting cultivation/agricultre currently under cultivation	Area of land owned by the HH	2.3	0.1	0.1	1.0	0.8	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.37	2.66
		Area of land rented out by the HH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.68
		Area of land borrowed or rented in by the HH	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.34
	Total average		**2.4**	**0.1**	**0.1**	**1.1**	**0.8**	**0.1**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.39**	**3.67**
2	Land used for shifting agriculture currently under fallow	Area of land owned by the HH	0.8	0.2	0.2	1.8	2.5	0.2	0.0	2.2	0.2	0.0	0.6	0.4	0.82	0.9
		Area of land rented out by the HH	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Area of land borrowed or rented in by the HH	0	0	0	0.2	0	0	0	0	0	0	0	0	0.02	0
	Total average		**0.8**	**0.2**	**0.2**	**2.0**	**2.5**	**0.2**	**0.0**	**2.2**	**0.2**	**0.0**	**0.6**	**0.4**	**0.84**	**0.9**
3	Land used for permanent agriculture															
		Area of land owned by the HH	4.0	3.9	4.8	3.8	4.2	2.8	2.1	5.4	2.2	3.3	7.3	2.5	3.9	7.31
		Area of land rented out by the HH	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.21
		Area of land borrowed or rented in by the HH	1.5	0.0	0.1	0.7	0.1	0.1	0.0	0.0	0.4	0.0	1.1	0.3	0.35	0.13
	Total average		**5.5**	**3.9**	**4.8**	**4.6**	**4.4**	**2.9**	**2.1**	**5.4**	**2.6**	**3.3**	**8.4**	**2.8**	**4.32**	**7.66**

S/N	Type of land	Type of ownership	Bwage	Diburuma	Difinga	Kanga	Kibatula	Kinda	Mafuta	Masimba	Maskati	Mndela	Msolokelo	Ndole	All Endline	All Baseline
4	Agroforestry areas															
		Area of land owned by the HH	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.07	0.34
		Area of land rented out by the HH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
		Area of land borrowed or rented in by the HH	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0
	Total average		**0.2**	**0.0**	**0.0**	**0.1**	**0.9**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.09**	**0.34**
5	Forest or woodland															
		Area of land owned by the HH	0	0.0	0.0	0.3	0.7	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.11	0.09
		Area of land rented out by the HH	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
		Area of land borrowed or rented in by the HH	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
	Total average		**0**	**0.0**	**0.0**	**0.3**	**0.7**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.2**	**0.11**	**0.09**

Annex 2.Household questionnaire

MRADI WA KUONGEZA THAMANI KATIKA MILIMA YA TAO LA MASHARIKI (AVA)

Namba ya dodoso:_____ **Tarehe:**____**/**__**/2018**

Jina la kijiji: _____ **Jina la kitongoji:**_____

Umbali kutoka senta ya kijiji :Km ____**Mita**_____ **au** **Dakika** _____

Jina la muulizaji:_____ **Jina la muulizwaji:**_____

Muda wa kuanza dodoso_____ **Muda wa kumaliza**_____

A. TAARIFA ZA MSINGI ZA KAYA

1. Je wewe ni mkuu wa kaya hii 01. Ndio _____ 00: Hapana_____ Kama sio mkuu wa kaya , mna mahusiano gani na mkuu wa kaya _____
2. Jinsi ya mkuu wa kaya 01.Mwanaume _____ 02.Mwanamke_____
3. Hali ya ndoa ya mkuu wa kaya 01. Ameoa/ameolewa____ 02.Hajawai kuoa/kuolewa____ 03: Wametengana___ 04:Mjane/Mgane_____.
4. Onesha idadi ya wanafamilia kwa kila kundi la umri na jinsi.

Umri	**Jinsi: 01=mwanaume, 02=mwanamke**		**Jumla**
	01=Mwanaume	02=Mwanamke	
0 – 5			
6-17			
18-35			
36 -45			
46-55			
56-65			
65+			

Kazi kuu ya mkuu wa kaya ni?.

01. Kilimo____. 02. Ajira ya mshahara ____.03. Vibarua (elezea) _____04. Ufugaji____05. Nyingine (eleza)_____

5. Elimu ya mkuu wa kaya?.

04. Hajasoma__01. Elimu ya msingi__02. Sekondari__03. Chuo (cheti/diploma)_05.Chuo kikuu___

6. Watoto wangapi wenye umri wa miaka 6 hadi 17 wanasoma? ___Wasichana. ___wavulana
7. Je mkuu wa kaya amezaliwa kijiji hiki? 01.Ndio____ 00.Hapana____
8. Je kabila la mkuu wa kaya ni kabila kuu la eneo ili? 01 __ Ndio 00 __ Hapana. Taja kabila la mkuu wa kaya_____

B. MALI ZA MKUU WA KAYA

9. Je unamiliki ardhi? 01. Ndio_____ 00. Hapana_____
10. Kama ndio umeipataje ardhi hiyo?

01. Kununua_____02. Kuirithi_____03. Kupewa na kijiji_____04. Kufyeka eneo la wazi la kijiji_____ 05. Njia nyingine (elezea)_____

Aina ya ardhi	**Kiasi kinacho milikiwa na kaya**		**Eneo lililokodiwa au kuazimwa**
	1. Eneo la ardhi linalo milikiwa na kaya (ekari)	**2.Eneo la kaya lililokodishiwa na watu wengine (ekari)**	**3. eneo la kaya limekodiwa kutoka kwa watu wengine (ekari)**
Eneo la kilimo linalotumika kwa kilimo cha kupumzisha ardhi/ lakini kwa sasa limelimwa			
Eneo la ardhi lililopumzishwa kwa sasa			
Eneo linalotumika kwa kilimo kila msimu na kila mwaka			
Eneo la kilimo msitu			
Shamba la miti			
Eneo la malisho			
Eneo lingine (elezea)			
Jumla			

11. Vifaa gani vimetumika kujengea nyumba anayolala mkuu wa kaya?

Hali ya nyumba		
1. Sakafu	**2. Ukuta**	**3. Paa**
01 = Matope	01 = Nyasi na nguzo	01 = Makuti/Nyasi
02 = Sementi	02 = Mbao/mabanzi	02 = Mabati
09 = Nyingine (elezea)	03 = Matope na nguzo	09 = Nyingine elezea
	04 = Matofali ya kuchoma	
	05 = Matofali ya sementi	
	09 = Nyingine elezea	

12. Je una mifugo ya aina ngapi na mingapi? Je bei ya mifugo iliyopo sokoni kwa sasa ni shilingi ngapi kwa kila mfugo?

Aina ya mifugo	**Kiasi**	**Bei iliyopo sokoni**	**Jumla ya thamani(TSH) (kiasi*bei)**

Aina ya mifugo	Kiasi	Bei iliyopo sokoni	Jumla ya thamani(TSH) (kiasi*bei)

13. Je una mali nyingine zaidi? Naomba uniambie kila mali na thamani yake halisi kama utauza kwa sasa?
Muhimu: Ni muhimu kurekodi malinyingine pia ambazo hazipo hapa kwenye hii orodha ambazo zinazidi zaidi ya thamani ya dola za kimarekani 25 au shilingi 25,0000TSh za kitanzania.

Mali	Idadi	Thamani kwa wastani	Jumla ya thamani
Trekta			
Gari			
Pikipiki			
Baiskeli			
Simu			
TV			
Dishi			
Radio			
Jiko la gesi			
Sofa set, makochi			
Cheniso			
Jembe la kukotwa na ng'ombe			
Toroli			
Kisima cha pampu			
Sola			
Generator			
Power tiller			
Mashine ya kukoboa na kusaga			
Nyingine >25000 zitaje			

C. MAJI NA NISHATI

14. Chanzo kikuu cha maji mnacho tumia ni kipi? _____
15. Mnatumia muda gani kwenda kuchota maji? kilomita___ Mita____ au ___dakika
16. Je maji yanapatikana kwa kipindi chote cha mwaka mzima?00. Hapana_____01.Ndio_____
17. Mnatumia choo cha aina gani?_____

1. Chanzo cha maji	**2. Aina ya choo**	**Maelezo**
01 = mifereji/mto	01 = Shambani/porini	
02 = kisima cha asili	02 = chao cha shimo tunashirikiana na kaya nyingine	
03 = Kisima cha wazi	03 = Choo cha shimo lakini cha kaya hii tu	
04 = Kisima kilichofunikwa	09 = kingine elezea	
05 = maji ya bomba		
06 = maji ya mvua		
07 = Chanzo kingine		

18. Unatumia nishati gani?

Kupikia	**Kuangaza**
01. Kuni	01. Mafuta ya taa
02. Mkaa	02.Umeme
03. Kinyesi cha ng'ombe	03.Generata
04. Masalia ya mimea	04.Sola
05. Gesi	09. Nyingine elezea
09. Nyingine elezea	

19. Unatumia kiasi gani cha kuni au mkaa kwa juma/wiki(chukua picha ya fungu la kuni au kipimo cha mkaa)

Chanzo	**Kiasi kwa wiki**
01.Kuni	
02.Mkaa	

D. KILIMO HIFADHI

20. Je umewahi kusikia neno kilimo hifadhi? 00.Ndio____01.Hapana_____

21. Kama ndio unaweza kunielezea kilimo hifadhi maana yake ni nini?

_____
_____
_____

_____
_____

22. Je umewahi kushiriki kwenye mafunzo ya kilimo hifadhi au uamasishwaji wa kilimo hifadhi?
    00.hapana___01.Ndio____

Tukio	**Taasisi iliyousika**

23. Je umetumia mbinu za kilimo hifadhi msimu huu au uliyopita?
    00.Hapana _____ 01. Ndio_____
24. Je umetumia mbinu moja wapo ya hizi?

01. Matuta ya kuzuia mmomonyoko	09. Kutumia dawa za magugu (zitaje)
02. Kutifua ardhi kidogo	10.Fanya juu fanya chini
03. Kilimo cha kubadilisha mazao kila msimu	11.Mazao mchanganyiko
04. Mazao funika	12.Dawa za wadudu
05. Matandazo	09.Nyingine zitaje

25. Msimu huu umeandaaje shamba lako?

01. kufyeka na kuchoma	05. Kulima kwa kutumia jembe la kukokotwa na ng'ombe
02. Kuchoma	06. kilimo cha mashimo
03. Kufyeka na kuacha masalia shambani ili yaoze	07. Kutumia nyasi kutengeneza matuta
04. Kutifua kwa jembe la mkono	09. Nyingine zitaje

26. Je umepata msaada ilikuboresha kilimo chako?

Aina ya msaada	Taasisi iliyosaidia

27. Je unatoa ushauri gani ili wakulima wengi waweze kijiunga na kilimo hifadhi?
_____
_____
_____
28. Je umepata faida yoyote tokea ujiunge na kilimo hifadhi? Kama ndio taja faida ulizo pata
_____
_____
_____
_____

E. UFUGAJI WA NYUKI

29. Je unajihusisha na ufugaji wa nyuki?
1. Hapana_____01. Ndio_____ kama ndio upo kikundi gani_____au _____ni mfugaji binafsi_____ (kama hapana ruka nenda kipengele F)
30. Unapata kiasi gani kwa mwaka?_____

31. Je umewahi kuhudhuria mafunzo au mikutano ya uhamasishaji wa ufugaji wa nyuki?
00. Hapana _____01.Ndio_____

Tukio	Taasisi

32. Je unatumia mizinga ya kisasa au ya kienyeji? 01 Kienyeji _____02. Kisasa_____
33. Je una mizinga mingapi? Kienyeji (idadi)_____ Kisasa (idadi)_____
34. Je umepata msaada wowote kutoka kwenye taasisi au shirika lolote?
00.Hapana_____01.Ndio_____

Aina ya msaada	Taasisi

35. Je kuna soko la asali na nta? 01.Ndio____(wapi unauzia)_____) 00.Hapana____
36. Je unavuna asali kiasi gani kwa mwaka na mzinga mmoja kwa wastani unavuna asali kiasi gani? Kwa mwaka _____ kiasi kwa mzinga_____
37. Je unapata fedha kiasi gani kwa mwaka kutokana na mauzo ya asali na nta?
_____
38. Je unatoa ushauri gani ili wanakijiji wengi waweze kujihusisha na ufuagaji wa nyuki?
_____
_____

F. UTUMIAJI WA MAZAO YA MISITU

39. Je unajihusisha na ukusanyiji wa masambu? 01.Ndio ____ 00. Hapana_____kama hapana nenda swali 44).

40. Unapata kiasi gani kwa mwaka kwa wastani? _____

41. Unatumiaaje fedha zinazotokana na ukusanyaji wa masambu?
_____
_____

42. Je umewahi kushiriki kwenye mafunzo ya ukusanyaji masambu?
00.Hapana_____01.Ndio_____

Tukio	**Taasisi**

43. Je unajishusisha na uvunaji wa mbao? 00. Hapana___01.Ndio_____

44. Je unajihusisha na uvunaji wa mkaa? 00. Hapana _____. 01 Ndio_____

45. Kama ndio unavuna wapi? Mbao _____ Mkaa _____

46. Je kijiji kinasheria za uvunaji wa mkaa na mbao? 00.Hapana ___01.Ndio_____

47. Kama ndio sheria hizo ni zipi?
_____
_____

48. Je unafuata taratibu za uvunaji zilizowekwa na kijiji? 00. Hapana ____01.Ndio_____kama hapana kwa nini haufuati taratibu_____

49. Unatumia matanuru ya aina gani wakati wa kuchoma mkaa? _____

50. Je soko kuu la mazao haya ya msitu ni wapi?

Zao	**Soko**
Mbao	
Mkaa	
Kuni	

51. Unapata fedha kiasi gani kwa mwaka kutokana na mazao haya ya msitu?

    i. Mbao_____

    ii. Mkaa_____

    iii. Mazao mengine(taja)_____,_____ ,
    _____, _____

52. Je kijiji kina utalii wa ikolojia? 01.Ndio_____00. Hapana_____kama ndio unajua mnapata kiasi gani kwa mwaka?_____

G. UPANDAJI WA MITI

53. Je unapanda miti? 00.Hapana_____ 01.Ndio_____
54. Je shamba lako unalima kwa kuchanganya miti na mazao mengine? 00.Hapana_____ 01.Ndio___
55. Je umepanda wapi miti yako?

Aina ya miti	**Wapi umepanda**	**Umepata wapi mbegu au miche**

56. Je umewahi kuhudhuria mafunzo au uhamasihaji wa upandaji wa miti?
    00.Hapana_____01.Ndio_____

Tukio	Taasisi

H. KIKUNDI CHA HISA (VSLA)

57. Je umewahi kujihusisha na kikundi cha Hisa? 00.Hapana_____01.Ndio_____ (kama hapana nenda swali 64).
58. Kwa sasa wewe ni mwanachama wa kikundi cha HISA hapa kijijini? 00.Hapana_____ 01.Ndio_____ (Kikundi kipi_____)
59. Je umeudhuria mafunzo yoyote au uhamasishwaji wa kujiunga na kikundi cha HISA?
    00.Hapana_____01.Ndio_____

Tukio	Taasisi

60. Je umewahi kuchukua mkopo? Kama ndio ni kiasi gani _____
61. Umeutumiaje mkopo huo?_____
62. Changamoto zipi unazipata au mnazipata kutokana na kuwa mwanachama wa HISA

_____
_____
_____
_____

I. MABADILIKO YA TABIANCHI, USIMAMIZI WA PAMOJA WA MISITU NA USIMAMIZI WA MISITU YA JAMII/MISITU YA KIJIJI

63. Je umewahi kusikia kuhusu mabadiliko ya tabianchi,Usimamizi wa pamoja wa misitu na Misitu ya jamii/misitu ya kijiji 00.Hapana_____01. Ndio_____
64. Kama ndio elezea jinsi unavyo fahamu?

Neno	Ndio/Hapana	Kama ndio toa maana yake
Mabadiliko ya Tabianchi		
Usimamizi wa pamoja		
Usimamizi shirikishi wa misitu ya jamii/misitu ya kijiji		

65. Je unaweza kuorodhesha baadhi ya visababishi vya mabadiliko ya tabianchi na madhara yake?

Kisababishi	Matokeo

66. Je unapata faida yoyote kutokana na misitu?00. Hapana_____01.Ndio_____
67. Kama ndio, ni kiasi gani cha fedha unachokipata kutokana na kuhifadhi misitu?

_____

68. Je umewahi kuhudhuria mafunzo au uamasishaji wa mabadiliko ya tabianchi, Usimamamizi shirikishi wa pamoja wa misitu na usimamizi shirikishi wa misitu ya jamii?

Tukio	**Ndio/Hapana**	**Taasisi**
Mabadiliko ya tabianchi		
Usimamizi Shirikishi wa misitu ya jamii		
Usimamamizi Shirikishi wa pamoja		

69. Je umewahi kusikia jinsi ya kukabiliana na mabadiliko ya tabianchi? 00.Hapana_____01.Ndio___
70. Kama ndio unaweza kuelezea ni nini?

_____

_____

71. Je umewahi kusikia Mradi wa AVA? 01. Ndio____00. Hapana_____kama ndio unaweza kuorodhesha kazi ambazo mradi wa AVA umefanya ilikuweza kuchangia utekelezaji wa kupambana na mabadiliko ya Tabianchi?

_____

_____

72. Je kaya yako imewahi kukumbwa na ukame au mafuriko au tukio lolote lilosababishwa na mabadilko ya tabianchi 00.Hapana_____01.Ndio
73. Kama ndio yataje?

_____

_____

74. Je umewahi kusikia kama kijiji kina kamati ya maliasili? 00. Hapana____01. Ndio___ kama ndio. Je unajua wanafanyakazi gani au wanamajukumu gani? 00. Hapana_____01.Ndio_____
75. Kama ndio wanamajukumu gani? Orodesha majuku yao?

76. Je unajua kama kijiji kina mpango wa matumizi bora ya ardhi, Mpango wa usimamizi misitu na sheria ndogo? kama ndio, taja matumizi ambayo mmeyatenga kisheria, taja baadhi ya maeneo ya msitu na sheria zilizopo kama unazijua?

_____

_____

77. Kama kijiji kina mpango wa matumizi bora ya ardhi, je wewe unaheshimu maeneo yaliyotengwa?

J. KIPATO CHA KAYA

1. KIPATO KITOKANACHO NA KILIMO –MSIMU WA KWANZA WA MWAKA KWA MIEZI 12 ILIYOPITA

Napenda kuangalia kipato chako kwa mwaka kinachotokana na kilimo kwa msimu wa kwanza wa mwaka kwa mieizi 12 iliyopita (jaribu kumueleza mkulima akueleze misimu ilivyo iliuweze kuenenda nae kwa mazingira yake

Na	**1. Zao**	**Jumla ya kiasi cha uzalishaji**		**Mauzo**			
		2	**3**	**4**	**5**	**6**	**7. Jumla Thamani ya kiasikilicho uzwa**
		Kiasi kilichovunwa	**Kipimo**	**Kiasi kilicho uzwa**	**Kipimo**	**Bei kwa kipimo**	

Napenda kujua gharama ulizotumia kwa kilimo msimu huu wa kwanza. *Muhimu: kwa pembejeo zilizo nunuliwa tu.*

Na	**Bidhaa**	**Kiasi**	**Kipimo**	**Bei kwa kipimo**	**Jumla ya gharama**
1	Mbegu				
2	Mbolea				
3	Mboji				
4	Dawa za kuulia wadudu na magugu				
5	Jembe la kukotwa na ng'ombe				
6	Vibarua				
7	Kukodisha mashine				
8	Usafirishaji				
9	Ufungashaji				

Na	Bidhaa	Kiasi	Kipimo	Bei kwa kipimo	Jumla ya gharama
10	Gharama nyingine (zitaje)				
11					

2. KIPATO KITOKANACHO NA KILIMO MSIMU WA PILI KWA MWAKA KWA MIEZI 12 ILIYOPITA

Napenda kujua kiasi cha kipato unachopata kutokana na kilimo kwa msimu wa pili kwa mwaka kwa miezi 12 iliyopita. *Muhimu: jaribu kumueleza mkulima akueleze misimu ilivyo iliuweze kuenenda nae kwa mazingira yake)*

Na	1. Zao	Uzalishaji		Mauzo			
		2	3	4	5	6	7. Jumla ya thamani ya kiasi kilichouzwa
		Kiasi kilicho vunwa	Kipimo	Kiasi kilicho uzwa	Kipimo	Bei kwa kipimo	
1							
2							
3							
4							
5							

Napenda kujua gharama ulizotumia kwa kilimo msimu huu wa pili wa mwaka kwa miezi 12 iliyopita . *Muhimu: kwa pembejeo zilizo nunuliwa tu.*

Na	Bidhaa	Kiasi	Kipimo	Bei kwa kipimo	Jumla ya Gharama
1	Mbegu				
2	Mbolea				
3	Mboji				
4	Dawa za kuulia wadudu na magugu				
5	Jembe la kukotwa na ng'ombe				
6	Vibarua				
7	Kukodisha mashine				
8	Usafirishaji				
9	Ufungashaji				
10	Gharama nyingine (zitaje)				
11					

3. KIPATO KITOKANACHO NA UZAJI WA MIFUGO KWA MIEZI 12 ILIYOPITA

Napenda kujua kiasi cha mifugo uliyo chinja au umeuza kwa kipindi cha **miezi** 12 iliyopita

1. Aina ya mfugo	2. umechinja kwa ajili ya kitoweo cha nyumbani au umempa mtu zawaidi	3. kiasi ulicho uza	Kiasi kwa kipimo	5. Jumla ya thamani ya kiasi kilicho uzwa (3 X 4)

4. KIASI KITOKANACHO NA MAUZO YA MAZAO YA MIFUGO KWA MIEZI 12 ILIYOPITA

Ningependa kujua kiasi cha mazao ya mifugo ulicho uza kwa miezi 12 iliyopita

1. Zao/huduma	2. Uzalishaji	3.Kiasi	4. matumizi ya nyumbani/zawadi	5. kilicho uzwa	6. bei kwa kipimo	Jumla 2*6
Maziwa						
Siagi						
Jibini						
Mayai						
Ngozi						
Mboji						
Mizinga						
Asali						
9. Nyingine taja_____						

5. GHARAMA ZA UFUGAJI KWA MIEZI 12 ILIYOPITA

Umetumia kiasi gani kuwatunza mifugo yako kwa kipindi cha miezi 12 iliyopita

1. Pembejeo	2. Kipimo	3. Kiasi	4. Bei kwa	5. Jumla ya gharam (3X4)
1. Malisho/chakula				
2. kukodisha nalisho				
3. huduma				
4. Vibarua				
5. Nyingine taja				

K. MABADILIKO YA KIPATO KITOKANACHO NA MAZAO YA MISITU KWA MIAKA 2

1. Je kaya yako imefyeka misitu kwa kipindi cha miaka 2 iliyopita? 01= Ndio 00= Hapana

Kama ndio' nenda swali 2. Kama hapana, nenda swali la 9

2. Kiasi gani cha eneo la msitu umefyeka kwa kipindi cha miaka 2 iliyopita?

	Shamba 1(ekari)	Shamba 2 (ekari)	Shamba 3 ekari
Jumla			

3. Kama ndio, lengo la kufyeka msitu ilikuwa ni nini?
2. mazao_____02. shamba la miti _____03.Malisho_____ 04 matumizi ya sio ya kilimo_____
4. Ni aina gani ya msitu uliyofyeka?_____
5. kama ni msitu ambao ulishawai kufyekwa tena huo msitu unamiaka mingapi tokea ulivyo chipua?_____
6. Msitu uliyofyeka ulikuwa unamilikiwa na nani? _____
7. Huo msitu uko mbali kiasi gani kutoka nyumbani kwako?_____

8. kiasi gani cha ardhi umeacha kukilima kwa zaidi ya miaka 2 ilikirudi kama msitu wa asili tena? *(weka eneo kwa ekari)*_____
9. Kwa kipindi cha miaka 2, ufyekaji wa misitu umepungua, bado upo vile vile, au umeongezeka? _____
10. Kama ufyekaji umepungua kwa kipindi cha miaka 2 ni kwa sababu gani?_____
11. Kama ufyekaji umeongezeka kwa kipindi cha miaka 2 iliyopita unafikiri ni kwa sababu gani? _____
12. Kwa kipindi cha miaka 2 iliyopita je matumizi ya kaya yako kwa mazao ya msitu hali iko je? _____
13. Kwa kipindi cha miaka 2 matumizi ya msitu kwa ajili ya kipato kwenye kaya yako iko je? _____

L. MITIZAMO YA USTAWI WA KIPATO KWA KAYA KWA KIPINDI CHA MIAKA 2

Muhimu: Kwenye maswali hapo chini, ukimuuliza swali msomee na majibu yake ili achague jibu linaloendana nae.

1. Je kipato chako ndani ya miaka miwili iliyopita kinatosheleza mahitaji ya kaya yako? 01.Ndio___ 02. Wastani_____ (kwa kaisi kinatosheleza); 00. Hakitoshelezi_____
2. Ukijilinganisha na kaya nyingine hapa kijijini, je kaya yako iko na hali gani ya kiuchumi? 01. kaya yangu iko vizuri zaidi_____ 02.kaya yangu ipo na uwezo wa wastani_____03.uwezo wa chini zaidi ya kaya nyingine_____.
3. Kaya yako inauwezo kiasi gani kwa sasa ukijilinganisha kwa miaka 2 iliyopita? 01. iko vizuri zaidi kwa sasa_____ 02.Wastani_____03. Iko chini sana kwa sasa_____. Kama jibu ni 01 nenda swali namba 4. Kama jibu ni 03 nenda swali 5. Kama jibu ni 2 nenda kipengele cha migogoro ya wanyama pori na binadamu.
4. Niambia kwa nini kaya yako ina hali nzuri kwa sasa ukilinganisha miaka 2 iliyopita?

_____
_____

5. Niambia kwa nini kaya yako ina hali mbaya zaidi kwa sasa ukilinganisha miaka 2 iliyopita?

M. WANYAMA WAHARIBIFU

1. Naomba uniambie ni wanyama gani wanaharibu mazao yako?

Myama	**Weka alama ya vema kwa kila mnyama takaye mataja**
Nguruwe pori	
Nyani	
Ngedere	
Kicheche	

N. Moto

2. Je unatumia moto kusafisha shamba? 00.hapana_____01.Ndio_____
3. Ni hatua zipi unachukua ili moto usivamie misitu na mapori?

Hatua za kuzuia	**Weka alama ya vema**
01. Kutengeneza njia ya moto	
02. kuwataarifu majirani	
03. Kuchoma nyakati za usiku	

4. Je umewahi kuhudhuria mafunzo ya moto au uamasishaji juu ya madhara ya mioto kichaa/moto pori 00.Hapana_____01.Ndio_____

Mwisho

Annex 3: KII tool

MUONGOZO WA MASWALI KWA VIONGOZI; TAARIFA ZA TADHIMINI WA MWISHO WA MRADI

MRADI WA AVA, MOROGORO

Jina la kijiji: _____ Kata: _____Tarehe: _____

Jina la muulizaji: _____ Muda wa kuanza:_____Muda wa kumaliza:_____

1. Kijiji kina wakazi wangapi na kaya ngapi? *(jaza jedwali hapo chini)*

	Wanawake	**Wanaume**	**Watoto**		**Jumla**
			Wavulana	**Wasichana**	
Jumla ya kaya					

2. Idadi ya wajumbe wa H/kijiji, VLUM na kamati ya Maliasili

Kamati	**Wanaume**	**Wanawake**	**Jumla**
Halmashauri ya kijiji			
Matumizi bora ya ardhi			
Maliasili			
Total			

3. Kamati ya maliasili na Matumizi bora ya ardhi wanakuwa na vikao vingapi kwa mwaka?

Kamati	**Wanawake wanao udhuria kwa wastani**	**Wanaume wanao udhuria kwa wastani**
Maliasili		
Matumizi bora ya ardhi		

4. Ni kaya ngapi zinanufaika na uvunaji wa mazao ya msitu kwa njia endelevu?.

Aina ya maliasili	**Idadi ya kaya**	
	Wanaume	**Wanawake**
Ufugaji wa Nyuki		
Uvunaji wa mbao		

Uvunaji wa Mkaa		
Ukusanyaji wa masambu		
Nyingine (zitaje)		

5. Idadi ya kaya zinazonufaika na huduma za jamii zilizotokana na fedha za maliasili ?
   wanawake_____wanaume_____
6. Je kijiji kinatumiaje mapato yanayotokana na msitu wa kijiji?

_____
_____
_____

7. Kama kimetumia kuboresha huduma za jamii, ni huduma zipi zimeboreshwa na ni kwa njia zipi huduma hizo zimeboreshwa?
   _____
   _____
   _____
8. Kiasi cha mkaa unaovunwa kutoka kwenye msitu wa kijiji ukilinganisha na idadi inayotakiwa kuvunwa kwa mwaka kwa mujibu wa mpango wa uvunaji wa msitu wa kijiji.

Kiasi cha mkaa kinacho vunwa kwa mwaka	**Kiasi gani kinatakiwa kuvunwa kwa mwaka kwa mujibu wa mpango**

9. Kiasi cha mbao kinacho vunwa kwa mwaka ukilinganisha na mpango unavyosema.

Kiasi cha mabo kinachovunwa kwa mwaka	**Kiasi kilichopendekezwa kwenye mpango**

10. Je mmesha saini mpango wa makubaliano wa usimamizi wa usimamizi wa msitu wa pamoja wa msitu wa kanga/Mkingu unaoelezea jinsi gani ya kugawanya majukumu na mapato yatokanayo na msitu huo?
    Ndio ____Hapana_____
    Kama ndio ni mwaka gani____ Je mnayo nakala ya makubaliano _____
11. Je ni mikutano mingapi imefanywa na wataalam wa TFS , MVDC na wanakamati ya maliasili?
    _____
12. Lengo la mikutano hiyo ilikuwa ni nini?
    _____
    _____
13. Je kijiji Chenu kinampango wa matumizi bora ya ardhi. Kama kinayo je watu wanheshimu mipango mliyojiwekea?
14. Je kuna kesi ngapi zinazoendana na watu kutoheshimu maeneo yaliyopangwa?

Tafadhali orodhesha majina ya washiriki

Annex 6. CA tool

Annex 7. KII questions