DFID CSAZ ADOPTION SURVEY REPORT

2019/2020

CFU RM, M&E

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This report presents key Adoption Survey findings for Year 4 upon the implementation of the CSAZ Programme by the Conservation Farming Unit under DFID in June 2016. This report covers the 2019/2020 CFU training period and farming season.

ACRONYMS

ADP	Animal Draught Power
CA	Conservation Agriculture
CAPI	Computer Assisted Personal Interview
CF	Conservation Farming
CFU	Conservation Farming Unit
CSA	Climate Smart Agriculture
CSAZ	Climate Smart Agriculture Zambia
CSPro	Census and Survey Processing System
CT	Conservation Tillage
DACO	District Agricultural Coordinator
DFID	Department for International Development
FC	Farmer Coordinator
FGD	Focus Group Discussion
FISP	Farmer Input Support Programme
FO	Field Officer
GRZ	Government of the Republic of Zambia
HH	Household
MRM	Monitoring and Results Measurement
MS	Microsoft
MT	Minimum Tillage
SAO	Senior Agricultural Officer
SFO	Senior Field Officer
SPSS	Statistical Package for the Social Sciences
ToC	Theory of Change
TSP	Tillage Service Provider

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EXECUTIVE SUMMARY

The Conservation Farming Unit (CFU), under the sponsorship of the British Government's Department for International Development (DFID), launched a 5-year Climate Smart Agriculture Zambia (CSAZ) program in July of 2016. The program seeks to improve food security to over a million people by providing trainings to an outreach of over 200,000 farmers annually across four of the CFU's areas of operations: Central, Eastern, Western and Southern regions. The project is guided by at least three theories of change. The first is that if farmers are well trained in Climate Smart Agriculture (CSA) technologies, **then** they will adopt the technologies. The second is that if the private sector (agro-dealers and tractor owners and suppliers) are well mobilized and activated, CSA technology adopters will realise even smooth and increased benefits of adoption. The third (not covered by this study) is that if farmers adopt CSA technologies, then they will achieve improved livelihoods and food security.

An internal survey was conducted by the CFU's M&E department. The study used a survey methodology to establish the proportion of farmers who, after the 2019 trainings, adopted the content of the CSA technology trainings. The survey was carried out across 13 districts and in all the four areas of CFU operations in Zambia. The sample size was 753 trained farmers each representing a unique household whose member was trained in 2019.

The survey established the values of Logframe indicators as follows:

- ✓ **Output indicator 1.1:** The total number of unique farmers trained in 2019 came to **272,512** (264,167 if those first trained before CSAZ are excluded) farmers. This surpasses the annual target of 269,000 by 1.3%. Of these **272,512**, 48.8% were females and 0.9% were disabled.

- ✓ **Output indicator 1.2:** After training, 93.1% of farmers trained were in the "Good" CSA Knowledge category **(of whom 43.5% were females and 0.9% were disabled).**

- ✓ **Output indicator 2.1:** Out of the **163,610** adopting farmers this season, the ttotal number of new adopters during the period under review was **107,150** farmers (13.1% women). CSAZ Sustained Adopters came to a total of **56,460**. Around 0.9% adopting trained farmers were disabled.

- ✓ **Output indicator 2.2:** Area of land under MT was **196,954 Ha** surpassing the set milestone of 181,210 Ha by nearly 9%. Area of land under CT however was below the set milestone of 108,700 Ha by reaching **56,146** Ha as maintenance of soil cover was greatly challenged due to drought years coming one after another making residue retention almost impossible. The third pillar of CSA, the practice crop rotation (CF) had annual target of 54,300 Ha but this target was also not achieved as area of land under CF reached **27,849** Ha, again falling short of the target by nearly 49% as economic and climatic factors were not quite conducive as preference was put more on immediate food security issues than long-term soil fertility drives..

- ✓ **Output Indicator 2.3**: Number of farmers using ADP and Mechanised tillage (New, women, disabled)). A total of **25,206** fee paying households used animals for ripping against a set annual target of 20,200. However, the Adoption survey shows that if focus is not only on those paying for ADP services but on anyone (including those that rip for themselves and had friends and relatives ripping for them), the number of farmers using ADP ripping from any source is **75,305**. As for Mechanised, a total of **11,759** farmers paid for tractors ripping services. The 2019/20 milestone was set at 2,650 households using mechanised ripping services.

✓ **Output indicator 2.4:** A total of **104,846** Total farmers using Herbicides (5.7% women and 0.9% disabled) Out of all these, 10,025 were new farmers that used herbicides for the first time.

This study helps to highlight several lessons that the CFU should use to improve programming during year 4. The following are some of the lessons learnt:

✓ The longer the CSAZ stays in an area, the higher the adoption rate.
✓ Even though the number of using ADP is high, it could even be higher. The major obstacle to ADP ripping is reported to be absence of a viable input market due to the obtaining macro-economic situation (complete with favourable access to financial recourses) for ripping implements.
✓ Women and disabled people continue to be resource constrained and therefore their access to enhanced livelihood inputs (ripping services and herbicides) continues to be supressed.
✓ Expecting to improve the lot of women and disabled without putting up specific and well-resourced interventions is going to remain a developmental pipe dream.

Key recommendations that should be seriously considered by the CFU as we prepare for the fifth and final year are as follows:

1. The CSAZ's (CFU) Private sector should continue to explore more and more ways of enabling households to have access to both financial resources and a ready local market for ripping implements.
2. Where potential animal draft power is relatively low, that is, in Central and Western Regions, emphasis should be placed more on basins as well as Tractor ripping and Basins.
3. If ADP is to be promoted any further in Central and Western, a complementary Livestock program may need to be put in place.
4. Even though the CSAZ has now entered its final year, the CFU and DFID could work out a special package and bring about an intervention meant to capacitate women and the disabled so that gender and disability talk does not remain a mere talk.

1.0 INTRODUCTION

This section gives a background to the Conservation Farming Unit (CFU) and the Department for International Development (DFID)'s sponsored Climate Smart Agriculture Zambia Programme (CSAZ). It details the Theory of Change (ToC) specific to adoption and gives the study objectives.

1.1 BACKGROUND OF THE CSAZ AND CFU

The Conservation Farming Unit (CFU), a not-for-profit organization being sponsored by the British Government's Department for International Development (DFID), under its Climate Smart Agriculture Zambia (CSAZ), provides trainings to an outreach of over 200,000 farmers annually across four (4) CFU operation regions namely; Central, Eastern, Western and Southern. This covers a total of 36 Zambian districts. The project has 82 Field Officers (FOs) and 11 Senior Field Officers (SFOs) across the four regions. Each FO trains and/or oversees training of about 2,700 farmers three times annually. The majority of trainees of the CFU are small-scale farmers in the rural areas of Zambia. These trained farmers are in turn expected to practice one form or another of minimum tillage as they have been trained. The previous of such types of trainings were conducted during the 2018 round of trainings in preparation for the 2018/2019 season namely:

- ✓ Period 1-Land Preparation (with three sessions similar in content, to cater for about 25 to 30 farmers expected in one training session),
- ✓ Period 2-Nutrient application, liming and seeding (three sessions as above),
- ✓ Period 3-Weed management (again with three sessions).

The core purpose of these trainings was to ensure that the farmer would move on to adopt the CF technology. Ideally a farmer needs to attend all three periods in order for them to gain the complete set of skills needed for full adoption. However, a farmer who goes on to attend at least period one and two and then practices (for year 1) minimum tillage (MT) would qualify to be called a Category 1 adopter i.e. Minimum Tillage – MT. Category 2 Adopters are those farmers that went on to use a combination of minimum tillage and the accrued compost of crop residues i.e. Conservation Tillage – CT. And Category 3 adopters are those farmers, now that we are in year 3 of the project, that went ahead and practiced CT as well as crop rotation i.e. Conservation Farming – CF. The survey sought to find out if and how many of those trained farmers had adopted the Climate Smart technology (disaggregating them by the categories defined above) and if not, why not. While these farmers are expected to be unique individuals, there has not been a deliberate policy stopping farmers from repeating trainings as it was felt that they would always have a genuine reason for being present in the same session as the one they attended before. None the less, the study also sought to find out reasons why some individual farmers choose to repeat trainings.

The survey also sought to get a feel of sustainability of adoption in areas where the CFU has exited, where adopting farmers were expected to sustain that adoption in the absence of the CFU. This was done by conducting Focus Group Discussions (FGDs) in exited areas. A further detailed study is expected to be commissioned and give more attention to this issue.

1.2 CSAZ THEORY OF CHANGE

The CFU's CSAZ Theory of Change (ToC) below outlines how training of farmers leads to adoption and other higher indicators like yield increase. The highlighted sections of the ToC were the subject matter for this Adoption Survey. The ToC breaks down the different categories of adopters and how these categories interact with each other. It follows from the ToC that trained farmers initially adopt the technology using Hand Hoe, Animal Draft Power (ADP) or tractors and over time adopt further by progressively moving from Minimum Tillage to Conservation Tillage and then to Conservation Farming. In the survey, questions were raised in such a way as to bring out those differences and see which category is 'housing' most of the adopters under the programme.

Figure 1: CSAZ Theory of Change
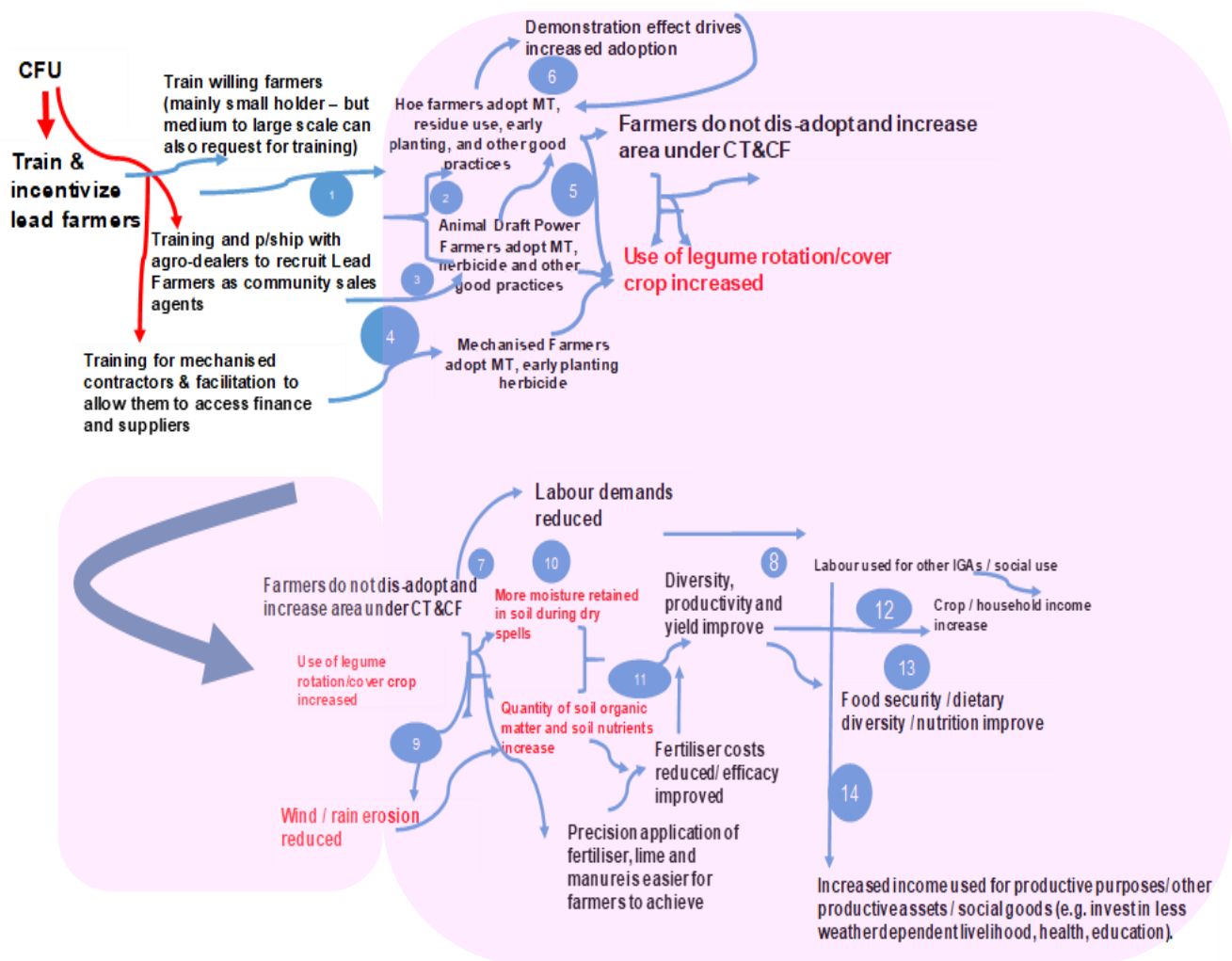
The survey also sought to establish whether farmers have progressed from Minimum Tillage (MT) to Conservation Tillage (CT) and ventured towards Conservation Farming (CF) by asking what tillage method they employed on the same field in question during the previous season and what type of crops were grown (to check for crop rotation).

1.3 STUDY OBJECTIVES

The main objective of this survey was to '***Establish the proportion of 2019 trained farmers that adopted the technology of Conservation Tillage (CT) and Conservation Farming (CF).'***

The specific objectives were as follows:

1. To determine the tillage methods used for each category of farmers.
2. To establish the average hectares cultivated per household under each of the following categories:
   a) Minimum Tillage b) Conservation Tillage c) Conservation Farming
3. To establish the number of CFU trained farmers disaggregated by gender and disability who have adopted climate smart agriculture at its different levels as defined by the CFU (see 2 above).
4. To determine when farmers prepared their land and planted their crops with regard to the time frame recommended for conservation agricultural practices in Zambia.
5. To establish the number of CFU trained farmers who have used herbicides as a form of weed management during the 2018/19 season.
6. To establish the proportion of trained farmers in the "Good" CSA Knowledge category post training (disaggregated by gender, and by disability).

1.4 DELIMITATIONS

The targeted respondents for this survey were the 2019 CSAZ trained farmers across all the four (4) regions of the CSAZ programme as named above. In these 4 regions and out of a total of 36 districts, the survey was carried out in 13 (36%) randomly selected districts - Chipata, Chadiza, Petauke, Chibombo, Chongwe, Masaiti, Kapiri, Kasempa, Mumbwa, Zimba, Pemba, Monze and Namwala. In addition, only Field Officers (FOs), Farmer Coordinators (FCs) and farmers from the sampled districts were eligible for being part of the survey.

1.5 CHALLENGES

As with every survey, conducting this Adoption came a few challenges but not too serious to have a negative impact on the survey results. The main challenge faced was difficulties in farmer identification which delayed the process a little because some farmers, especially women, use different names in the villages from the ones they register during trainings. FCs came in very handy in such cases. The second challenge was the language barrier specifically in Kasempa and Mwinilunga where most farmers only speak Kaonde and Lunda respectively. Interpreters were used but it only made the process a little slower than usual. Lastly the third challenge was farmers being too expectant to receive handouts especially in North-western. They would ask before an interview what they were going to receive. However, they were told that the CFU did not give handouts which discouraged some from being interviewed.

2.0 STUDY METHODS

This survey was conducted in all four (4) regions of the CSAZ project (namely Central, Eastern, Western and Southern) in specific randomly sampled districts within these regions. The overarching methodological framework was sample survey and the data collection tool was a structured questionnaire. Qualitative data was first captured in Computer Tablets (Computer Assisted Personal Interview - CAPI) using Census and Survey Processing System (CSPro) software version 7.3.1 and then analysed using the Statistical Package for Social Sciences (SPSS) before exporting data to MS Excel for graphing and tables. Qualitative methodologies such as Focus Group Discussions (FGDs) and open-ended discussions with Farmer Coordinators (FCs) and Field Officers (FOs) were used. Physical field observations of the crop status at the time of the survey was also done.

2.1 STUDY TOOLS

The tools used in this study were Structured computer-based questionnaire, Focus Group and Open-Ended Discussions, and Field observations.

2.1.1 Structured Computer Based Questionnaire

The structured questionnaire, administered by the enumerators, was a systematic compilation of questions whose specific purpose was to determine the actual practices/adoption taken up by farmers after training in the 2019/20 farming season. The fact that the sample was generated from a database of farmers who were trained by the CFU under CSAZ in the 2019/20 season meant that the resultant adoption pattern can be attributed to the trainings during 2019 as well as to prior trainings. Furthermore, the questionnaire incorporated aspects of gender and disability in households (HHs) in order to establish the extent to which women and people living with disability within the household own land and make decisions regarding the land they own in cases where they do. Such decisions would include (but not limited to) what tillage method to use, how big a field to till as well as what crops to grow. Another aspect of gender was with regard to the sex of the trainer and opinions on whether this would have had a different impact on the training or on the farmers had the trainer been of the opposite sex. Assets owned and inputs accessed were also areas of interest covered by the questionnaire. The questionnaire is attached as Annex 1.

2.1.2 Field Observations

Actual observations of the crops in farmers' fields at the time of the survey were made where the farmer had not yet harvested the respective crop that was under CF. Enumerators were trained to make a judgement of whether the crop would be categorised as a "write off", "Fair" or "Good".

2.2 SAMPLING

All the four CFU regions were taken as part of the sources of data. Sampling was three-tiered: Random sampling of 13 out of the 36 districts within these regions was done in order for the survey to have an unbiased spread of information. From each sampled district, a random sample of Field Officers (FOs) and Farmer Coordinators (FCs) was first done before finally carrying out a further random sampling of farmers under each sampled FC. The sampled

farmers all came from the register of unique farmers trained by the CFU in 2019 and were proportionately spread across all sampled areas taking into consideration the size of the areas and the number of trained unique farmers. There was no need to sample untrained farmers as this survey was establishing adoption levels after exposing farmers to trainings.

2.2.1 Geographical Sampling

As earlier mentioned, sampling was done randomly at all levels in the different areas. It was decided that the study would take place in all the four CSAZ areas (CFU Regions) so as to ensure representativeness by capturing any variations introduced by ecological and human resource factors.

Regional and District Level Sampling

Table 1: Sample sizes (Regions and Districts)

As is shown in Table 1, the first column indicates the CFU CSAZ regions. The second column shows the randomly sampled districts and then the third column shows total sample sizes randomly drawn from each district. The initial sample size calculation required from a population of all 2019 trained farmers was 384 based on regional training numbers. But that figure was almost doubled because of the vast areas that the CFU covers. This enabled the survey to be as representative as possible in reflecting an accurate picture of what happened after farmers were trained by the CFU in the 2019/20 agricultural season. Picking smaller samples from everywhere would not have had the same results as picking reasonable numbers from representative districts. All in all, the survey reached 753 unique households represented by a trained household member.

Region	District	Sample Size	Regional Totals
Central	Chibombo CR	62	300
	Chongwe	63	
	Kapiri	109	
	Masaiti	66	
Eastern	Chipata	56	200
	Chadiza	49	
	Petauke	95	
Western	Mumbwa	50	90
	Kasempa	40	
Southern	Namwala	65	163
	Zimba	34	
	Pemba	24	
	Monze	40	
Survey Total			**753**

Field Officer and Farmer Coordinator Level

From each district, it was also essential that there was random sampling for field officers and the respective farmer coordinators (FCs) under them (for the same reason as given above when sampling districts). Table 2 shows how the sampled farmers were distributed among the different randomly sampled Field Officers (FOs) in the various randomly sampled districts across the four regions. Once the FOs were chosen, a list of Farmer Coordinators (FCs) under them was drawn and then also randomly sampled. The pool of farmers to be interviewed was the training register attendance list.

Table 2: Sample Sizes (Field Officers)

Region Code	District	Field Officer	Sample Size
Southern	Namwala	Derick Chizinga	65
	Zimba	Starzia Mwitumwa	34
	Pemba	Osia Njobvu	24
	Monze	Actress Musumali	40
Western	Mumbwa	Marvel Mwiinga	27
	Mumbwa	Beatrice Munyimba	23
	Kasempa	Andrew Kayengo	40
Eastern	Chipata	Norman Nguni	29
	Chipata	Francis Ndima	27
	Chadiza	Womba Kalezhi	50
	Petauke	Daniel Banda	47
	Petauke	Hezron Ngulube	47
Central	Chibombo CR	Ernest Buleli	61
	Chongwe	Dyness Mutofwe	63
	Kapiri	Gilbert Lungu	110
	Masaiti	Ruth Phiri	39
	Masaiti	Joseph Kwalombota	27
Total			**753**

2.3 DATA MANAGEMENT

Data was collected by 14 enumerators who were engaged for the purpose. These had already been trained in similar surveys and hence were very familiar with how to carry out the survey. Nevertheless, before actual data collection, the enumerators underwent an intensive two-day training workshop which included field trial run and testing of the survey tool. Trial runs were carried out in Chipata district in Eastern Region. Again, real CFU trained farmers were interviewed in the trial runs.

The actual data collection was done using Computer Assisted Personal Interviewing (CAPI) software on Huawei Tablets and therefore all information obtained was electronic. The interviews were designed using CSPro 7.3 Software which ensured that data obtained was of the highest possible quality at that level. Quality assurance rules were also built into the CAPI software and this included logic like skipping to the next section if a question was non-applicable to the respondent or not allowing an interviewer to proceed if a response was not entered where it was required.

The analysis tool used, SPSS, allowed for robust data management and analysis as it makes use of syntaxes in order to scrutinize the datasets obtained. SPSS enables one to generate different variables and perspectives from which to approach data analysis. Microsoft Excel was also incorporated into the data analysis process for enhanced visuals and graphic presentation of survey findings.
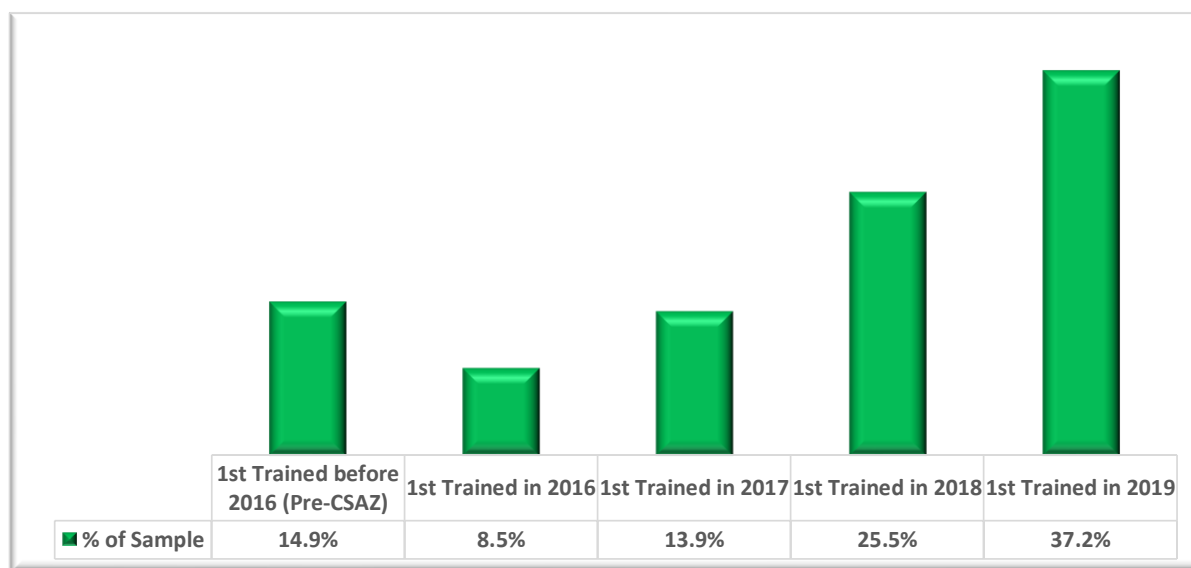
3.0 SURVEY FINDINGS

This section focuses on the demographic results obtained from the survey. It highlights the composition of the sampled households (HHs) of the farmers trained in the year during the 2019/20 season, the sex of the household head (HH head) as well as the sex of the trained person, and any disabled persons within those households. Farmers were categorised into four groups depending on which years they attended trainings by the CFU as well as when they were first trained by the CFU. The section also focusses on household labour size, the number of HH members receiving the same training, reasons for repeating trainings and the ages of trained farmers. Asset ownership focused on the availability of animal draft power from oxen and donkeys as well as the farm implements that are appropriate to the CF practices. It will be determined if some oxen owners also provided ADP tillage services to farmers. Field day attendance by farmers was also analysed.

First however, focus will be put on secondary data on the CSAZ outputs to date so as to give readers an insight into the training of farmers during the 2019 (Year 4 of the project) training period.

3.1 Demographics
3.1.1 Farmer Trainee Sub-category.

Figure 2: Farmer Trainee Category - When were you first trained?

	1st Trained before 2016 (Pre-CSAZ)	1st Trained in 2016	1st Trained in 2017	1st Trained in 2018	1st Trained in 2019
■ % of Sample	14.9%	8.5%	13.9%	25.5%	37.2%

Firstly, it suffices to mention that all the sampled farmers were trained in 2019. However, Figure 2 shows training categories of farmers in line with when they were trained for the very first time in CSA by the CFU, i.e. which year was their first time to be trained by the CFU. As can be seen from Figure 2 above, the majority of the sampled farmers (37.2%) were trained for the very first time in 2019 followed by those who were trained in 2018 at 25.5%. Over 85% of the total sample were first trained only under the CSAZ program, leaving less than 15% as those who were trained before the program. The CFU always encourages farmers to have multiple trainees from the same HH so that in case

a member who was trained travels or falls ill, another member can continue with the practice if they choose to adopt. HH multiple attendees will be looked at in section 3.1.5 below. For the purpose of this survey, only one member was sampled and interviewed from each individual HH.
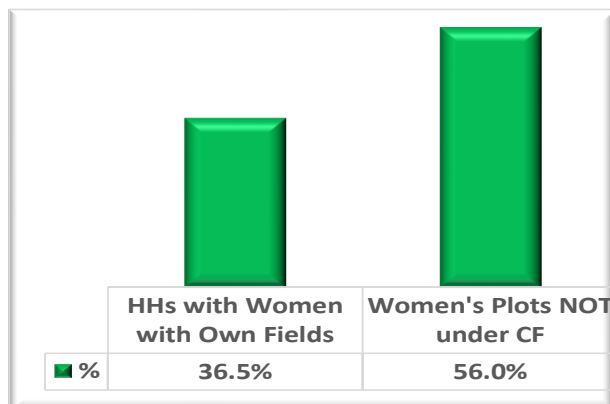
3.1.2 Gender of Household Head.

From the sample size of 753, data show that 504 respondents were heads of households and out of the 504 heads of HHs, **78.5%** were males and **21.5%** females. Later on, however, when those farmers first trained before CSAZ are filtered out, the HH Head composition will change to **78.0%** Male headed and **22.0%** female headed. In fact, note that from this point onwards, data analysis has filtered out those farmers first trained before CSAZ. Adoption patterns and trends by gender are discussed in Section 4.4.1 below following the issue of gender of HH head.

3.1.2.1 Women in Agriculture – CSAZ Only

Figure 3: Proportion of women in HHs with own plots

Here we focused on sampled persons that were women and reported to have cultivated pieces of land directly under themselves. Results showed that out of the 753 HHs, only 36.5% of those women have their own fields, the majority depend on family-owned fields. And of the 36.5% of the women with their own fields, around 56.0% are likely to use CF on those fields.

	HHs with Women with Own Fields	Women's Plots NOT under CF
■ %	36.5%	56.0%

3.1.2.2 Disabled Persons in Agriculture – CSAZ Only

Figure 4: Proportion of Disabled people in HHs with own plots

	HHs with Disabled Persons with Own Fields	Disabled Persons' Plots under CF
■ %	0.6%	75.0%
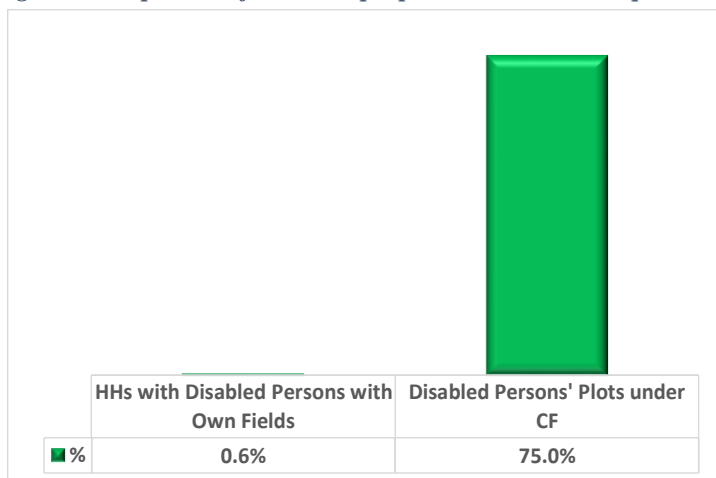
We also focused on disabled persons within sampled households that were reported to be cultivating pieces of land directly under themselves. Only 0.6% of the total sample was the proportion of HHs with disabled people owning plots. And of the 0.6% of the disabled with their own fields, around 75.0% are likely to use CF on those fields.
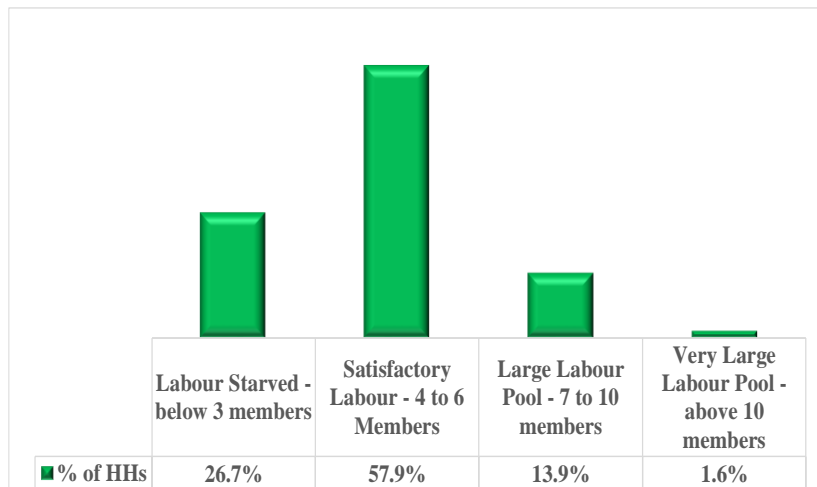
3.1.3 Household Labour Size

Labour restrictions combined with a lack of resources means that some farming families might not be able (assuming they want to) to convert more plots to CF MT until later on when the benefits of labour and input savings are realised and ploughed back into outsourced labour. This is because, before trying it out, farmers have a perception that CF is labour intensive but once they have converted, that story changes. However, labour constraints affect all farming households irrespective of the tillage practices they are doing and not just CF adopters or those wishing to adopt and/or expand their holdings under CF. The categories regarding labour restriction are outlined in the bullet points below:

- ✓ Labour Starved if they have less than three labour active members;
- ✓ Satisfactory Labour if they have three to six labour active members;
- ✓ Large Labour Pool if they have seven to ten labour active members and
- ✓ Very Large Labour Pool if they have more than ten labour active members

Labour security here is defined as the ability to potentially have labour available even if one labour active person should fall sick during the time when labour is demanded. As can be seen below in Figure 5, very few households are labour starved.

Figure 5: HH Labour Security

	Labour Starved - below 3 members	Satisfactory Labour - 4 to 6 Members	Large Labour Pool - 7 to 10 members	Very Large Labour Pool - above 10 members
■ % of HHs	26.7%	57.9%	13.9%	1.6%

Overall, most of the trained farmers' households have satisfactory labour (57.9%). Still, over a quarter are labour starved and only 13.9% have at least large labour pools and all from large HHs as expected. This means that, *if labour availability was a real constraint, only about 26.7% can fail to convert to CF*.

3.1.4 Training Attendance.

This subsection briefly profiles the sampled respondents' training history. They were asked when was the very first time they received training from the CFU in Climate Smart Agriculture. It will be noticed from Figure 6 that in all three periods, the year 2018 and 2019 saw phenomenal increases of new farmers turning up for training. This is

clearly because of the CFU moving into new operational areas. Indeed as can be remembered from 2018 annual report, there was a spike in the figures for total trainees.

Figure 6: CSAZ Trainees by Year First Trained (by Gender)
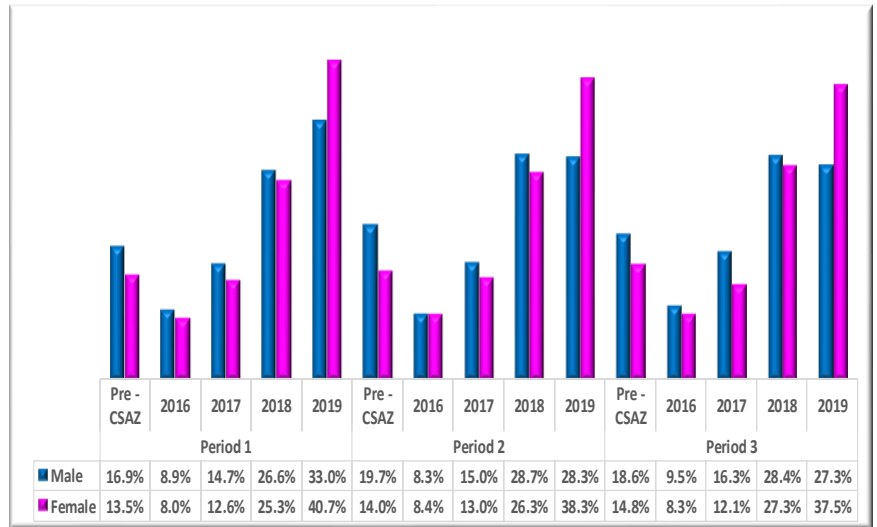
The sample also showed a remarkable difference in the gender proportions in 2019; the proportion of females attending each period for the first time in 2019 is at least 7% higher than that of male counterparts – even for the herbicide training offered by Module 3 (Period 3).

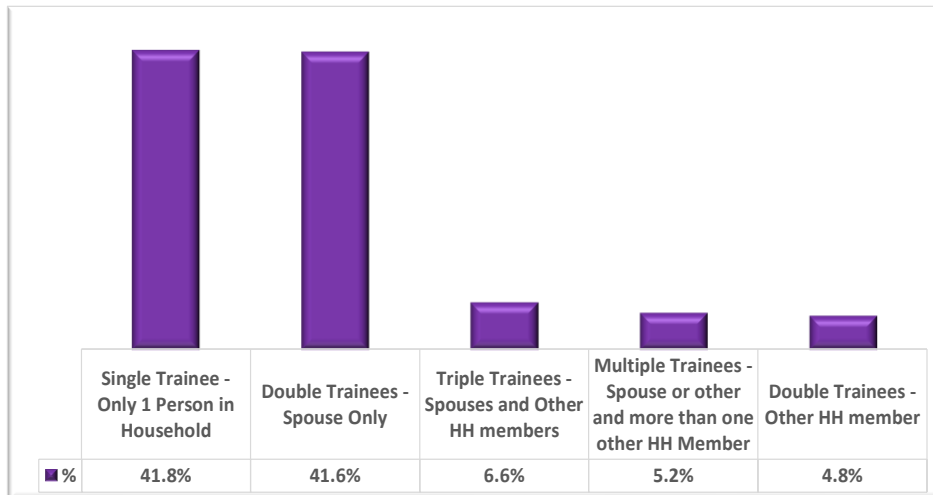|	Period 1					Period 2					Period 3				
	Pre - CSAZ	2016	2017	2018	2019	Pre - CSAZ	2016	2017	2018	2019	Pre - CSAZ	2016	2017	2018	2019
Male	16.9%	8.9%	14.7%	26.6%	33.0%	19.7%	8.3%	15.0%	28.7%	28.3%	18.6%	9.5%	16.3%	28.4%	27.3%
Female	13.5%	8.0%	12.6%	25.3%	40.7%	14.0%	8.4%	13.0%	26.3%	38.3%	14.8%	8.3%	12.1%	27.3%	37.5%

3.1.5 Multiple Trainees within the Household

Figure 7: CSAZ Multiple Trainees within a Household

	Single Trainee - Only 1 Person in Household	Double Trainees - Spouse Only	Triple Trainees - Spouses and Other HH members	Multiple Trainees - Spouse or other and more than one other HH Member	Double Trainees - Other HH member
%	41.8%	41.6%	6.6%	5.2%	4.8%

The CFU still holds that it is important to ensure that a household has more than one person trained in the CF practices as well as other technical sessions such as weed control. Spouses are encouraged to attend trainings together and to subsequently support each other as they try out and eventually adopt the practices.

The CFU also encourages three or more persons from each farming household to attend training if they are going to be actively engaged in key farming operations over the course of the season. This whole-family approach also ensures that if one person is not present for whatever reason(s) during the season, then there is at least one other person capable of managing that operation.

An analysis done on the number of trainees in the household brought to light the occurrence of training of more than one person within the household – usually the respondent and an additional person/people. Figure 7 above shows the results of the survey. It was discovered over the course of the survey that 41.6% of the households surveyed indicated double trainees comprising respondents and their spouses. Around 41.8% of the HHs represented at trainings are
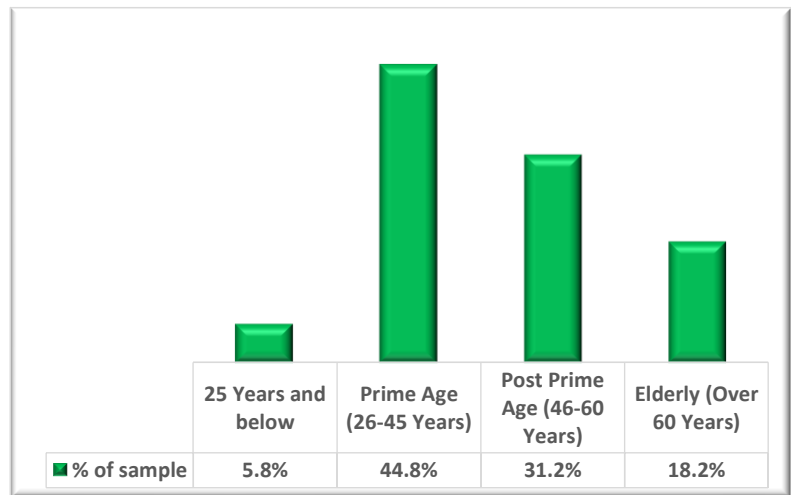
more likely to be just one individual trained, while 5.2% of the trained HHs are likely come from HHs where more than 3 members were trained.

3.1.6 Age of trained farmers

The expectation here is that CF technologies would be passed from one generation to the next. For this to happen, the young to middle aged adults should be the majority attending trainings rather than the old. Figure 8 looks at the age categories of farmers trained by the CFU.

Figure 8: *Age of Respondents*

Figure 8 meets the expected trend. The right population to lay the ground work for a generational crossing of farmers who will continue to carry out and expand CSAZ practices (all those below 46 years) constituted a total of. In any society, drivers of new technologies can be considered to be those between the ages of early to middle 20's and 45 years old. This is notably the age group of most rural farming communities. This group,

	25 Years and below	Prime Age (26-45 Years)	Post Prime Age (46-60 Years)	Elderly (Over 60 Years)
% of sample	5.8%	44.8%	31.2%	18.2%

accounting for half of the farmers trained, as shown in figure 8, also appears to be supported by older and more experienced farming members within the communities who have been farming for a relatively longer time (those in the 46 to 60 years age bracket). As such, the CSA technology will hopefully become a sustainable practice over time and generations to come even in the absence of active trainings by the CFU.
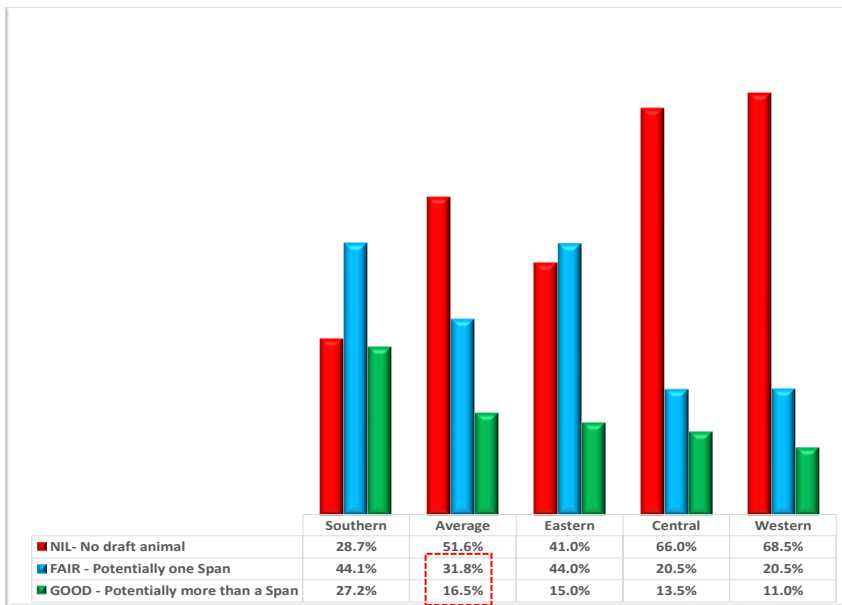
3.1.7 Potential Animal Draft Power (ADP) in Households

Many farmers have pointed out that CF Hoe basins is more labour and time consuming. Hand hoe basin digging is indeed a deterrent to adoption, then farmers who own animals should theoretically be more likely to adopt CF ADP MT. Farmers who have lost their animals and do not have access to other draft power animals may or may not turn to hoe tillage whilst they build up their animal asset base. It was therefore realised that it would be important to try and ascertain the level of animal ownership.

As shown in Figure 9, the survey reveals that Southern Region (SR) has more farmers with animals that can potentially be used as ADP (over 70%) than any other region followed by Eastern Region (ER) with 60.0%. The flip side is that SR is likely to have the least number of HHs with no ADP and CR is most likely going to have most of the HHs with no ADP. This is an expected tendency as the farmers in the Southern province, mainly of Tonga and Ila origin, culturally place a high value on cattle and consider it to be a symbol of wealth and therefore draw much

pride from owning many. Western region has quite a considerable number of Tonga people that moved from SR. However, the Tsetse-fly infected National Parks are not very conducive to cattle rearing and fortunately, in that region, the mechanisation strategy worked well and they mostly depend on tractors for ripping. Note that on average, around 48% of the households have some form of draft capacity that, if the CSAZ puts more and more effort, can be channelled towards ADP ripping.

Figure 9: Potential Animals for Draft Power in Households by Region – CSAZ trained only

	Southern	Average	Eastern	Central	Western
NIL- No draft animal	28.7%	51.6%	41.0%	66.0%	68.5%
FAIR - Potentially one Span	44.1%	31.8%	44.0%	20.5%	20.5%
GOOD - Potentially more than a Span	27.2%	16.5%	15.0%	13.5%	11.0%

This observation, in the light of the assumption that digging CF basins is more laborious and time-consuming, can be an opportunity to scale up the use of animal draft power (ADP) amongst farmers especially in SR and ER where households are most likely to have the most potential for ADP in order to be able to fully exploit ADP tillage methods and thus push up adoption through ADP ripping. Where potential animal draft power is relatively low, that is, in Central and Western Regions, emphasis should be placed more on basins as well as Tractor ripping and Basins. It would be of interest in Section 4 to find out the extent to which those with draft power used it to rip their own as well as other people's fields.

3.1.8 Field Days Attendance - CSAZ trained only

The survey also asked farmers concerning field day attendance by members from the respondents' households. It was hoped that previous years' trainees (if they have not yet adopted), would have their resolve to adopt in subsequent years strengthened if they attended field days and witnessed first-hand the results of the trainings as out what they had learned during training sessions.

Figure 10: Field Days Attendance (2018 vs 2019)

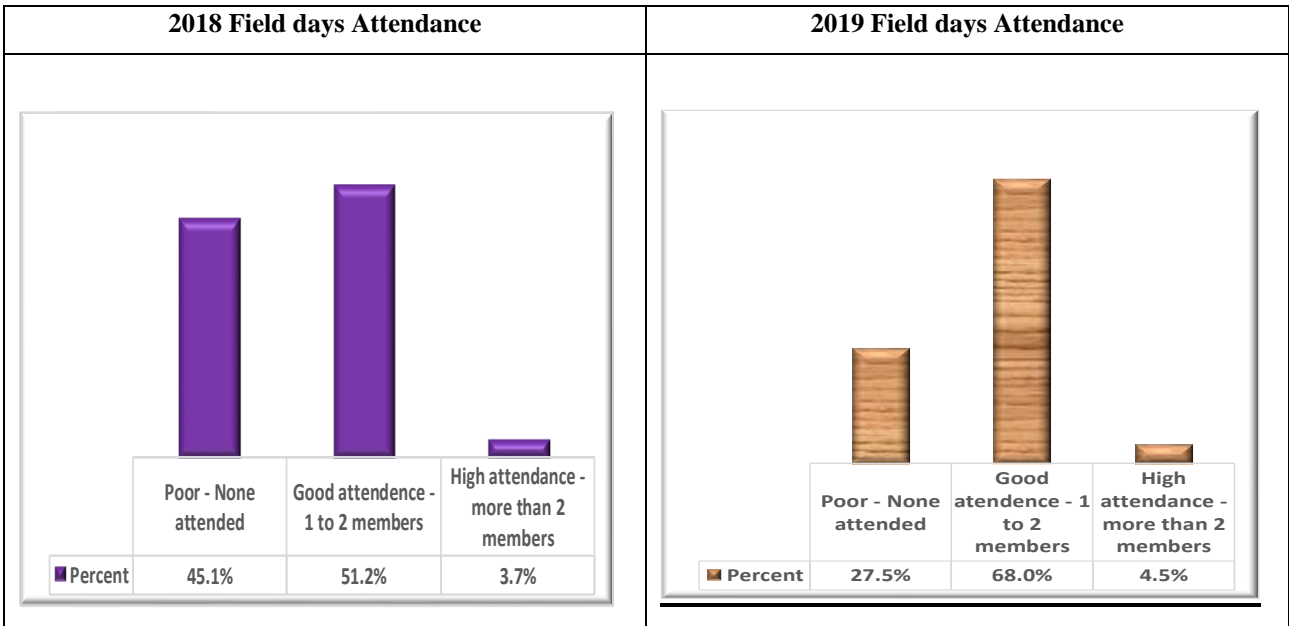| 2018 Field days Attendance			2019 Field days Attendance		
Poor - None attended	Good attendance - 1 to 2 members	High attendance - more than 2 members	Poor - None attended	Good atendence - 1 to 2 members	High attendance - more than 2 members
Percent 45.1%	51.2%	3.7%	**Percent** 27.5%	68.0%	4.5%

Figure 10 shows that over 72% of those trained in 2019 ended up participating in a Field day prior to training with only around 28% not attending any field day. This compares favourably with the 2018 figure of around 55% attending field days. The effect of field day attendance on adoption may need to be investigated in the next Section of this report (Section 4). It has become clear that so far, the whole point of field days is to funnel interested farmers to training. Theoretically therefore, if training leads to adoption, then field days promote adoption as it leads farmers to attend trainings.

3.1.9 Level of CSA Knowledge among 2018 Trained farmers – Post Training Vs Pre-Training

The CSAZ Theory of Change's main entry point is that training leads to increased knowledge of technologies and this may in turn influence whether or not one will eventually adopt the technologies. Knowledge acquisition levels is in fact indicator 1.2 in the CSAZ Log-frame (Proportion of trained farmers in the "Good" CSA Knowledge category post training).

Figure 11: Proportion of Trained farmers scoring at least "Good" - Post Test.

	Male	ALL	Female
Low Knowledge Level	2.5%	6.9%	11.4%
Good Knowledge Level	97.5%	93.1%	88.6%
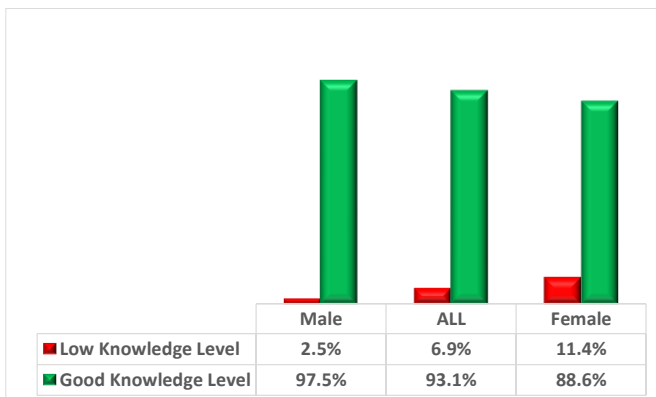
From Figure 11, it can be observed that even though the proportion of males exhibiting higher levels of CSA knowledge is higher than the sample average of 93.1%, still a lot of female respondents (88.6%) are also in the "Good knowledge level" category.

Output indicator 1.2: Post training, 93.1% of farmers trained were in the "Good" CSA Knowledge category (49.6% Males and 43.5% Females. The Logframe also required that this be disaggregated disability status. The

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proportion of trainee farmers that were disabled was very low (0.9% according to the training database). We can hence only extrapolate that if 93.1% of the 272,512 farmers trained in 2019 where in the "Good" CSA Knowledge category then 0.9% of these were disabled. But since the random sample did not capture any disabled, this is an extrapolated figure. Perhaps next year's sample will try and bring in a proportional sample of disabled people.
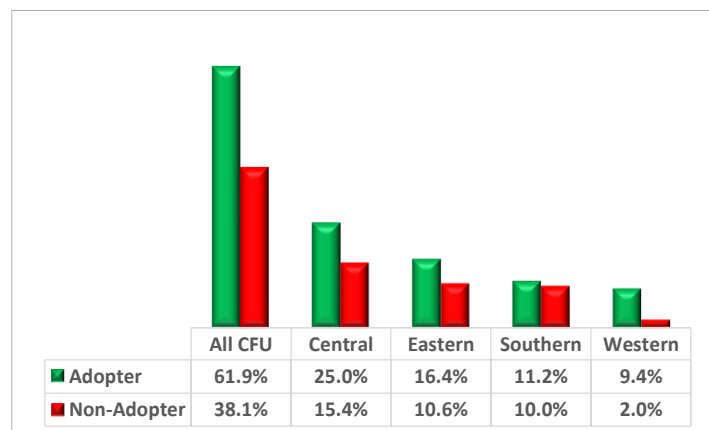
4.0 UNDERSTANDING ADOPTION

Since this is the fourth year of the CSAZ, adoption of the CSA technology will now be placed into three categories: Category 1 (MT) adoption will be defined by any minimum **tillage practice used to carry out land preparation**, Category 2 (CT) will be defined by a combination of MT and the retention and actual use of crop residue for the purpose of moisture retention, erosion control and improving soil fertility, and Category 3 (CF) will be defined by a combination of CT and crop rotation. It is however important to note that the Conservation Farming Minimum Tillage practice is what really defines and separates an adopter from all conventional farmers and conventional farming practices. Adoption starts with and is maintained through minimal to zero soil disturbance. CT and CF farmers are important in showing the success of efforts to encourage farmers to take up all the three principles of CSA.

This section will focus on trainee categories and the proportion of trainees in specific CSA pillars. We need to note that while the CSAZ trained 272,512 individual farmers, only 264,167 were trained for the first time under CSAZ and the other 8,345 had already received training by the CFU before CSAZ started. The new thinking now is to focus (for indicator 2.1) on farmers trained only under the CSAZ, that is, the 264,167. Data from FGDs and FC interviews will throw light into reasons for non-adoption. The section will also proceed to profile the adopters by considering pertinent factors such as gender of HH head, HH labour size, HH ownership of draft power, etc. Other factors such as timeliness in accessing inputs, timeliness in planting, weed management and herbicide usage will also be considered.

4.1 Adopters of a CSA technology.

The first point for discussion is a focus on adoption. What proportion of households took up a CSA promoted technology in the current year 4 season? Figure 12 below presents a picture of minimum tillage adoption, as well as focussing on the trainee category. This answers to the CSAZ Logframe indicator 2.1; *Number of farmers sustainably adopting CF practices following attendance at CFU training. (disaggregated by New/Old;*

Figure 12: Percent of (Total)Adopters Across Regions

	All CFU	Central	Eastern	Southern	Western
Adopter	61.9%	25.0%	16.4%	11.2%	9.4%
Non-Adopter	38.1%	15.4%	10.6%	10.0%	2.0%

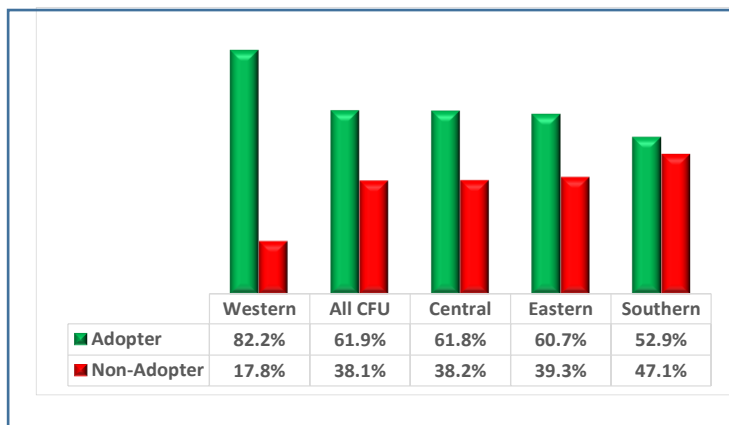*gender, disability)*. To "sustainably adopt" is to be an adopter of a minimum tillage practice in this current (2019/20) season as well as in the previous (2018/19) season. New adopters are those that have taken up Minimum Tillage for the **first time** during this current season (2019/20). This is not to say they were **first** trained in 2019, but that they adopted for the first time only in 2019/20 season.

4.1.1 Minimum Tillage Adopters

First, we focus on establishing the number of Minimum Tillage adopters before further establishing how many of these have sustainably adopted this season. This is in order to bring out the disaggregation by new and sustained adopters as indicated in the respective Logframe indicator. Figure 12 shows that out of all trained farmers (first trained under the CSAZ) 61.9% adopted MT in at least one plot in the 2019/20 season. This means that **163,519** of the 2019 trained farmers have taken up minimum tillage. Central Region contributed 25.0% towards this figure followed by Eastern contributing 16.4% towards the 61.9% total adopters.

Figure 13: Percent of Adopters within Region

	Western	All CFU	Central	Eastern	Southern
Adopter	82.2%	61.9%	61.8%	60.7%	52.9%
Non-Adopter	17.8%	38.1%	38.2%	39.3%	47.1%

It is also of interest to find out adoption rates **within** each Region, ie., out of all farmers trained in the same Region, what proportion adopted. Figure 13 shows this result. Western Region tops the list of adopters within Region as it has around 82% of the trainees having adopted this season. This is despite the fact that it did not however train as many farmers as other Regions. This is mainly because it is the Region with the bulk of old CSAZ Regions (only Kasempa is new). This points to the fact that the longer the CSAZ stays in an area, the higher the adoption rate.

Output Indicator 2.1: Number of farmers sustainably adopting CF practices

Figure 14: Proportion of CSAZ Trained Farmers - Adoption Status and Trainee Category

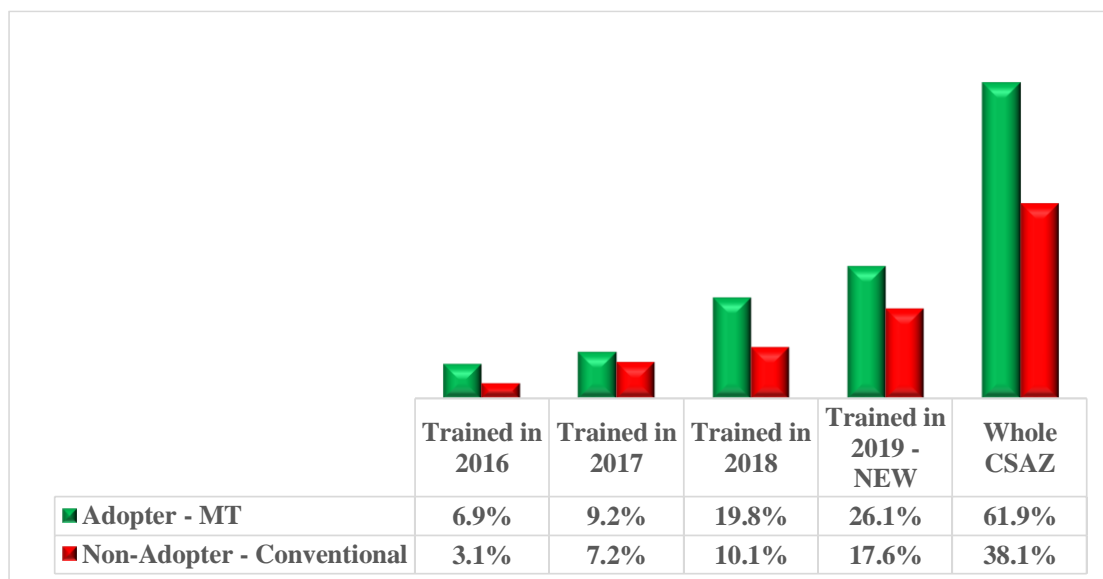|	Trained in 2016	Trained in 2017	Trained in 2018	Trained in 2019 - NEW	Whole CSAZ
Adopter - MT	6.9%	9.2%	19.8%	26.1%	61.9%
Non-Adopter - Conventional	3.1%	7.2%	10.1%	17.6%	38.1%

Figure 14 provides the proportions for which actual numbers (shown in Figure 15) can then be extrapolated. In the meantime, it will be helpful to note that 61.9% of 264,167 trained farmers adopted. This translates to a total of **163,610** farmers having adopted in the 2019/20 season. The same Figure 14 also shows out of the 264,167 farmers that were trained in Year 4, there is a chance that 26.1% of them started adopting in the same year, **they are new adopters**. This means the first batch of **NEW** adopters is 26.1% of 264,167 (=68,824). These, however, are not the *only NEW adopters* since it is known that some farmers attend training in one season only to adopt in the second or even third season after first training. So, to get the total of new adopters for this season, there is need to look even at farmers trained by the CSAZ **before** the current season and find out whether or not this season was their first time to adopt OR they have been adopters even in the previous season (thereby becoming sustained adopters).
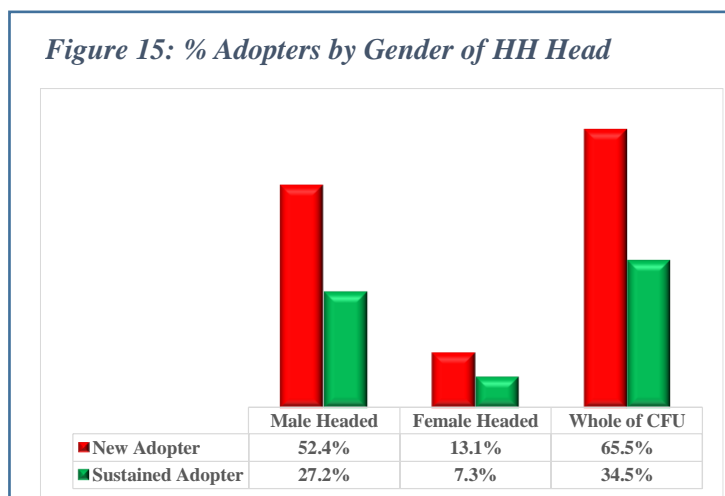
It is at that point when those old farmers who have only adopted for the first time will be added to Year 4 adopters to get a total for **new** adopters, and those old farmers that have been adopters before this current season are categorised as "**sustained adopters**". This means that there is need for more analysis to find out new and sustained adopters by excluding the 2019 trained adopting farmers (the 68,824) from the analysis. What is already known is that the total number of adopting farmers in 2018/19 season is **163,610** farmers out of the 264,167 CSAZ trained farmers. If **163,610** is the total number of adopters for financial year 4, and 68,824 of them were NEW by virtue of having been trained and adopting only in Year 4, then the rest (94,787) are Old farmers that have also adopted. Some of these 94,787 old farmers may have adopted *only for the first time* **in FY4** while the rest are actually sustained adopters as they adopted for more than one season. The analysis therefore filtered out the 68,824 new adopters from the 163,610 adopters (that is, removed those first trained in 2019 and adopted in FY4) and reanalysed the resultant adopters' subset to establish the proportion of **old farmers** (trained before 2019) that are **sustained adopters** and those that should equally be categorised as **NEW** adopters even though they were first trained before 2019. Table 3 below shows the proportions (*NB, this is only as a CSAZ proportion of adopters that were first trained before 2019 and hence the extrapolated figures are the respective proportion of the 94,787 adopting farmers that were first trained before 2019*).

Table 3: Proportion and Extrapolated Number of Old adopting Farmers (By New and Sustained)

	Proportion	Estimated total (N=**94,787**)
Old CSAZ Trainee-New Adopter	40.4%	38,327
Old CSAZ Trainee-Sustained Adopter	59.6%	56,460

What remains is to bring together number of NEW adopters and sustained adopters. The figure for new adopters is the sum of New adopters from Table 3 (38,327) and the new adopters that were first trained in 2019 as already estimated in the paragraph above (the 68,824). Thus, the total for New adopters for Year 4 comes to **107,150** farmers. The total for sustained adopters as shown in Table 3 are **56,460.**

Figure 15 completes the Logframe requirement of further disaggregating new adopters by gender. Out of the **107,150** new adopters in the 2019/20 season, data analysis show that around 13.1% of these new adopters were female headed farmers. Again, the figure for disabled adopters can be extrapolated from the fact that we know that only 0.9% of the trained farmers were disabled people.

Figure 15: % Adopters by Gender of HH Head

	Male Headed	Female Headed	Whole of CFU
New Adopter	52.4%	13.1%	65.5%
Sustained Adopter	27.2%	7.3%	34.5%

It was of interest to establish whether being a sustained adopter was dependent on the gender of the head of household. Table 3 is a Chi-Square table investigating this.

Table 4: Chi-Square Test - Sustained Adoption is independent from Gender of HH Head

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.054	1	.081
N of Valid Cases	397		

The Null hypothesis was that being a sustained adopter is independent of the gender HH head. The Chi-square statistic here is 3.054, 1 degree of freedom, and the p-Value is 0. 081. We are testing at the 5% level of significance (alpha = 0.05). Now, 0. 081 is larger than the alpha value. We therefore FAIL to reject the Null hypothesis. *There is NO evidence to suggest an association between being a sustained adopter and whether or not the head of household is male or female.*
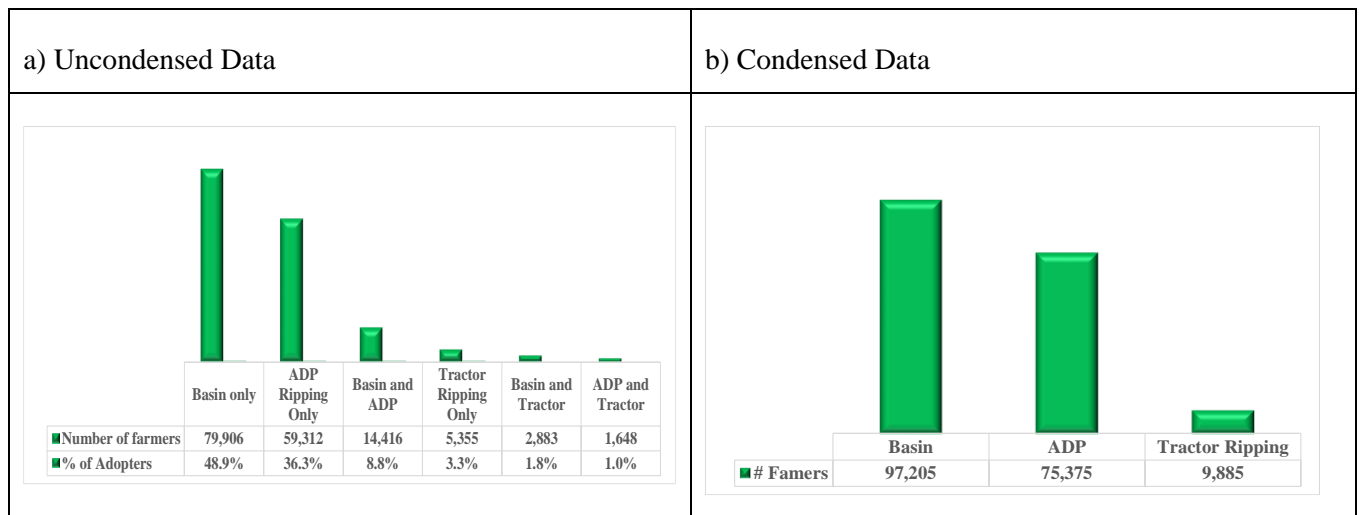
Tillage Methods Used by Category 1 Adopters.

Output Indicator 2.3: Number of farmers using ADP and Mechanised tillage

It is important for the CFU to take stock of the very tillage methods that were being used during this season by adopting households. This has a bearing on *Output Indicator 2.3: Number of farmers using ADP and Mechanised tillage (disaggregated by draught power).* This indicator, however, may have to be re-looked. The CSAZ promotes private players to provide tillage services (ADP and Mechanised TSPs). So, if this indicator is intended to measure the success of the promotion of TSPs, it should therefore refer only to those farmers that accessed/ paid for land preparing through hiring TSPs. The value for this indicator would therefore be the TSP report. However, there is still

an interest in finding out the number of farmers using ADP and Mechanised ripping regardless of whether or not they paid a TSP or used own or "free" service from relatives/neighbours/friends. This discussion will focus on the later.

It noted above that **163,610** farmers adopted. Further reflection has shown something that neither the CFU nor the CSAZ has been conscious of when coming up with this indicator and subsequent measurements. Figure 16 (component a) shows that farmers, in practice, actually use more than one tillage method.
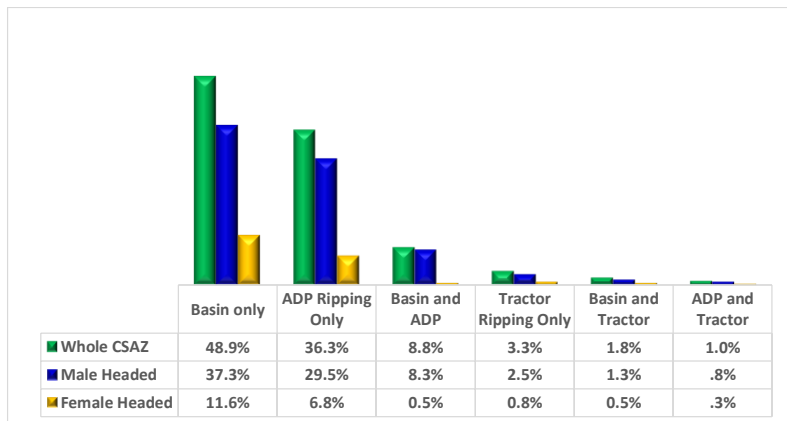
Figure 16: Number of Farmers using Specific Tillage Methods

a) Uncondensed Data						
	Basin only	ADP Ripping Only	Basin and ADP	Tractor Ripping Only	Basin and Tractor	ADP and Tractor
Number of farmers	79,906	59,312	14,416	5,355	2,883	1,648
% of Adopters	48.9%	36.3%	8.8%	3.3%	1.8%	1.0%

b) Condensed Data			
	Basin	ADP	Tractor Ripping
# Famers	97,205	75,375	9,885

In practice, the indicator has come to specifically refer those paying for services of CSAZ trained TSPs and not any other user of ADP or Tractor ripping. This is the reason why the figure for the indicator value is from the TSP study in a separate report. In addition, based on this report, the indicator may not have had the intention of capturing only those using **one** tillage method and ignore any other additional method. However, it should be realised that there would be a double counting when the same individual uses, for example, tractor ripping and ADP ripping; the same individual would be counted under each of the tillage methods. It should also be noted that the Logframe indicator 2.3 is not clear on which users of ADP and mechanisation to count. Since this comes under the promotion of Private sector tillage supplers, perhaps for this season, like previous seasons, we would continue to only focus on fee paying users of ADP and Mechanised ripping. So the values shown in Figure 16b will not be for Logframe purposes but for understanding the totality of CSAZ's promotion of tillage methods regardless of whether the farmer hired or used his/her own animals/tractor for ripping. The Logframe figures would come from the TSP Rapid appraisal report (a separate report from this report).

This complication came to light when it was realized that a household could have as many as 5 plots under a CSA minimum tillage method and can in fact potentially use each of the three method in three plots resulting in that individual being counted three times.
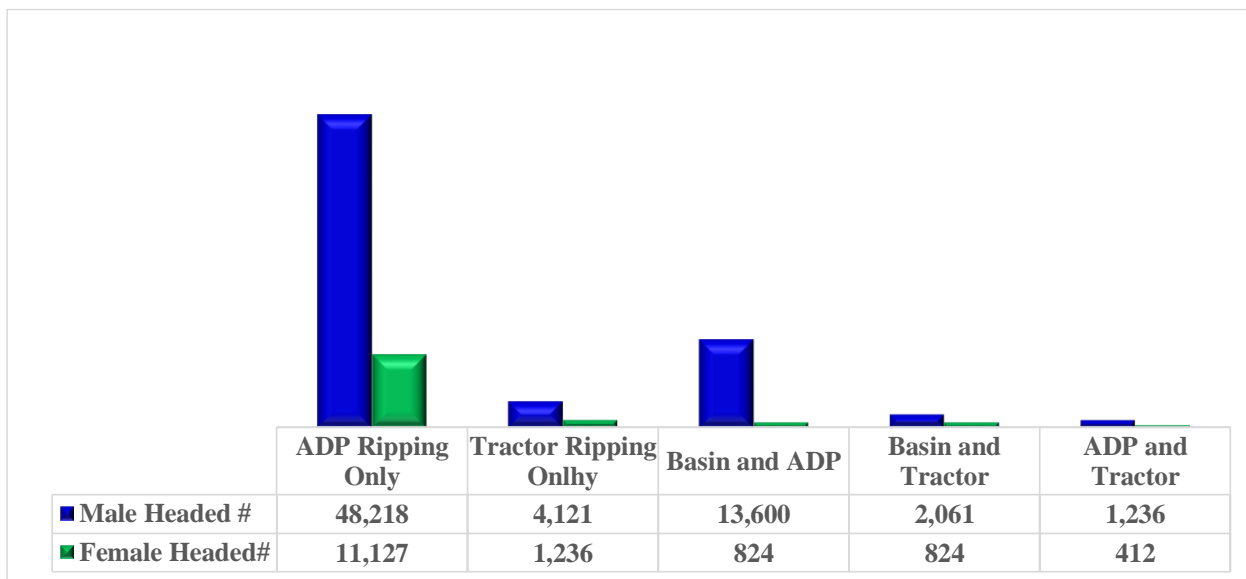
Figure 17: Percentage Tillage Methods used by Gender of HH Head

	Basin only	ADP Ripping Only	Basin and ADP	Tractor Ripping Only	Basin and Tractor	ADP and Tractor
Whole CSAZ	48.9%	36.3%	8.8%	3.3%	1.8%	1.0%
Male Headed	37.3%	29.5%	8.3%	2.5%	1.3%	.8%
Female Headed	11.6%	6.8%	0.5%	0.8%	0.5%	.3%

It is of interest to look at gender usage by focussing on tillage type within each gender category. Figure 17 show that when compared across all tillage methods, within gender categories, even though more male headed households (37.3%) are likely to use basins only, they also dominate in the use of other tillage methods. This is unlike female headed households whose use of other methods (other than basins) is greatly reduced, leading to a result of only 1.5% for tractor ripping and 7.6% for ADP ripping (in combination with other methods). Figure 18 shows the numbers by the various combinations of ripping technologies (the figure for basins only has been left out from Figure 18).

Figure 18: Tillage Methods employed by adopters (within gender of HH Head)

|	ADP Ripping Only	Tractor Ripping Onlhy	Basin and ADP	Basin and Tractor	ADP and Tractor
Male Headed #	48,218	4,121	13,600	2,061	1,236
Female Headed#	11,127	1,236	824	824	412

When farmers who adopted using mechanised ripping where asked when first they had used a tractor for ripping, only **4.2%** of them noted that they had used a tractor for the first time in 2019/20 season. This is the figure that is also needed for the Logframe value.

4.1.2 Category 2 (CT and CF) Adopters – Soil cover and Crop Rotation

Focus now moves towards those farmers that deliberately kept crop residues for the purpose of soil cover as taught during the CSAZ trainings of 2019 going back. There is no need to focus on farmers that were trained in 2019 since training took place AFTER farmers had harvested and hence these are not expected to have retained some crop

residue for a deliberate purpose of soil cover. One can only graduate from being simple Category 1 (MT only) adopter to a Category 2 (Conservation Tillage) CT adopter if one has sustainably adopted and is currently an adopter. The computations for the number of CT farmers here should thus be understood to be focussing only on those MT **sustained adopting farmers trained in 2019/20 season** (totalling **56,460** farmers). Results (Figure 19) show that 82.6% of the MT sustained adopters went on to keep crop residue (practice CT), bringing the total of CT farmers to **46,641.** Of these farmers, analysis show that 16.1% **(7,509)** were female headed households.

Figure 19: Conservation Tillage by Sustained Adopters

	CT Adopter	Non-CT Adopter
▪ Percent	82.6%	17.4%
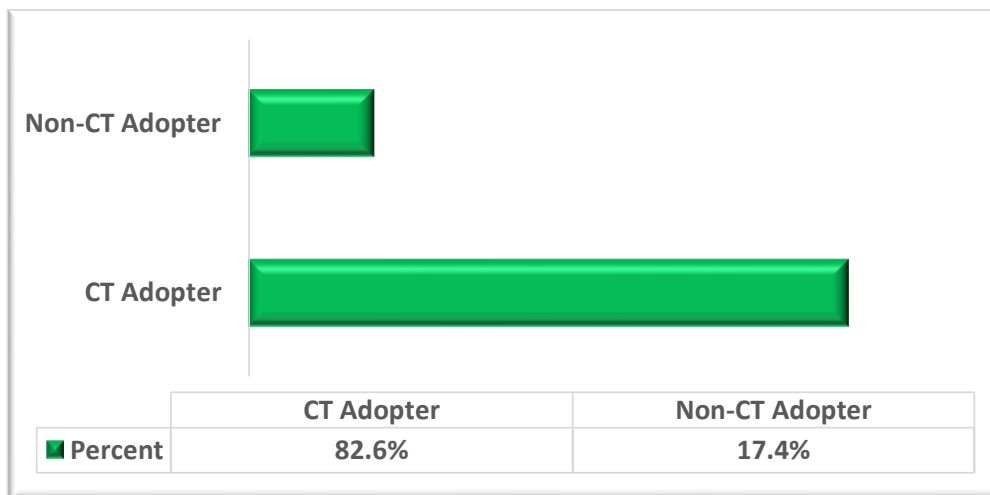
Turning to CF, again the computation considers only those farmers that would have used CT (**46,641**) and went on to take up crop rotation. Analysis of the data shows that 49.6% of the CT adopters went on to practice crop rotation (practice CF), bringing the total of CF farmers to **23,134** (20.8% were female headed). This data will be used to compute Output Indicator 2.2: Area of land under MT, CT and CF (section 4.2 below).

4.2 Area of land under MT, CT, CF

Output Indicator 2.2: Area of land under MT, CT, CF

The CSAZ requires that the area of land put under minimum tillage as well as that under conservation tillage be computed. For the third year, area of land under CF will also have to be computed as this study decided to be cautious by seeking to postpone investigating crop rotation in year two but rather wait and do this for year three. Available survey data showed that the minimum area of land under MT was 0.06 hectares and the maximum was 14 hectares. It became convenient to use the statistical averages in coming up with values for the Logframe indicators. First to be computed was the average area of land that category one adopters (MT) had. The Median land area under MT was 0.6 hectares, mean was 1.2038 Ha and hence if a total of 163,610 farmers adopted MT, then the total area under MT (based on the mean) was around **196,954 hectares**. This achievement would surpass the Logframe milestone of 181,210 hectares by 8.7%.

Secondly, using the same method, the data was also used to compute average land area under CT by Category 2 adopters. As stated above 46,641 farming households come under CT adopters. Now, available data show that the mean was 1.2038 Ha hence the total area of land under CT was therefore **56.146** hectares against a target of 108,700 hectares, falling below the target Hectarage by around 48%. Admittedly, the previous season has been a drought season and hence expecting retention of crop residue under such conditions may be perhaps to expect too much. This achievement alone may be sufficient to show that farmers are indeed paying heed to the message even in difficult conditions.

Finally, again using the same method, it has been stated above has shown that **23,134** farming households used CF. Available data show that the mean was 1.2038 Ha and therefore total area of land under CF was **27,849** hectares against a target of 54,300 hectares, falling below the target CF Hectarage by nearly 49%. It should be however emphasised here that crop rotation is still being influenced by several other factors such as inputs availability and markets for leguminous outputs. The previous farming situation had been influenced by factors ranging from drought to poor markets for leguminous crops (especially soya beans whose prices had drastically fallen and left farmers seeking to avoid further losses by growing this crop simply for rotation purposes. For this reason, attributing achievements or under achievements to CSAZ alone should be carefully done.

4.2 Other Adoption Considerations
4.2.1 Weed Management through Herbicides.

In every district of operation, the challenges that potential adopters always face is the control of weeds. If not effectively controlled, weed infestation always discourages farmers from real adoption of the MT technology. Weed infestation is the major reason why some go on to plough (ridge) over the basins or rip-lines and thereby reversing minimum soil inversion (the very essence of CA). In this survey alone, several farmers in fact had adopted MT at land preparation but then because of weed challenges, they later on moved in and ploughed the already ripped (or basin) plots and hence became non-adopters. In trying to control weeds, the CFU introduced herbicide trainings towards the beginning of the season so that farmers have information on weed management before they are overwhelmed by weeds. The CFU places a lot of importance on this such that weed management is a training topic on its own. In this period however, other methods of weed management are also discussed because sometimes it is appropriate to combine the different methods so that farmers have a variety of choices.

The CSAZ Logframe aimed that by the third year (the season of 2019/20) over 102,440 farming

Figure 20: Proportion of farmers using Herbicides

	Male Headed	Female Headed	All CFU
Used Herbicide	32.8%	5.7%	38.5%
Did Not Use Herbicide	47.2%	14.3%	61.5%
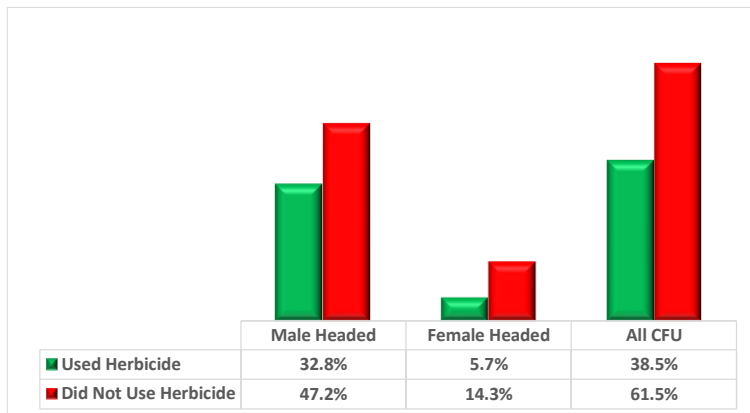
households would be using herbicides. Figure 20 shows that only 38.5% of all the 272,512 (104,846) farmers managed to both secure resources for the purchase of and used herbicides in their plots. Further analysis shows that out of all these 104,846 farmers, 5.7% were female headed and 10,025 were first time users.

For reasons already noted elsewhere, female headed households are usually resource constrained and participation in any livelihood enhancer that is resource hungry becomes a challenge. Paradoxically, there is no specific package (in spite of having pointe this out for a long time now) that is dedicated to enhancing women participation and yet the CSAZ Logframe continues to strengthen the call to measure the impact of CSAZ participation on women and disabled people.

It is important to note that not all the herbicide users were adopters. Once more, the Logframe discussions did not settle on what figures to use and this time around the complication is worsened by the recommendation to only count (in some indicators) only those farmers that first trained under the CSAZ. Now we have three possible interpretations; herbicide users among people (anyone) trained by the CFU in 2019, herbicide users among farmers only trained for the first time under the CSAZ, and herbicide users among adopters only trained for the first time under the CSAZ, For this reason, the value of this Logframe indicator depends on the final interpretation. If herbicide users to be reckoned are only those that **adopted and were first trained under the CSAZ**, then the figure will be different that is obviously lower than the one reported above and since the 2019/20 milestone was set with "everyone" in mind, there is not much use in using any other value except the one that captures achievement based on "everyone".

5.0 CONCLUSIONS, LESSONS LEARNT, AND RECOMMENDATIONS.

5.1 Conclusions

This subsection focusses on drawing out conclusions that can furnish us with values for indicators to with adoption. With reference to the output indicators in the CSAZ Lofgrame, from survey findings we can conclude that:

- ✓ **Output indicator 1.1:** The total number of unique farmers trained in 2019 came to **272,512** (264,167 if those first trained before CSAZ are excluded) farmers. This surpasses the annual target of 269,000 by 1.3%. Of these **272,512**, 48.8% were females and 0.9% were disabled.

- ✓ **Output indicator 1.2:** After training, 93.1% of farmers trained were in the "Good" CSA Knowledge category **(of whom 43.5% were females and 0.9% were disabled).**

- ✓ **Output indicator 2.1:** Out of the **163,610** adopting farmers this season, the total number of new adopters during the period under review was **107,150** farmers (13.1% women). CSAZ Sustained Adopters came to a total of **56,460**. Around 0.9% adopting trained farmers were disabled.

- ✓ **Output indicator 2.2:** Area of land under MT was **196,954 Ha** surpassing the set milestone of 181,210 Ha by nearly 9%. Area of land under CT however was below the set milestone of 108,700 Ha by reaching **56,146** Ha as maintenance of soil cover was greatly challenged due to drought years coming one after another making residue retention almost impossible. The third pillar of CSA, the practice crop rotation (CF) had annual target of 54,300 Ha but this target was also not achieved as area of land under CF reached **27,849** Ha, again falling short of the target by nearly 49% as economic and climatic factors were not quite conducive as preference was put more on immediate food security issues than long-term soil fertility drives..

- ✓ **Output Indicator 2.3**: Number of farmers <u>using</u> ADP and Mechanised tillage (New, women, disabled)). A total of **25,206** fee paying households used animals for ripping against a set annual target of 20,200. However, the Adoption survey shows that if focus is not only on those paying for ADP services but on anyone (including those that rip for themselves and had friends and relatives ripping for them), the number of farmers using ADP ripping from any source is **75,305**. As for Mechanised, a total of **11,759** farmers paid for tractors ripping services. The 2019/20 milestone was set at 2,650 households using mechanised ripping services.

- ✓ **Output indicator 2.4:** A total of **104,846** Total farmers using Herbicides (5.7% women and 0.9% disabled) Out of all these, 10,025 were new farmers that used herbicides for the first time.

5.2 Lessons Learnt

Four major lessons clearly emerge from what has been observed among adopters. These are:
- ✓ The longer the CSAZ stays in an area, the higher the adoption rate.
- ✓ The fact that around 48% of households actually have animals with the potential to provide ADP ripping services should be greatly exploited for the upscaling of ADP ripping. The major obstacle to ADP ripping is

reported to be absence of a viable input market (complete with favourable access to financial recourses) for ripping implements.

✓ Women and disabled people continue to be resource constrained and therefore their access to enhanced livelihood inputs (ripping services and herbicides) continues to be supressed.

✓ Expecting to improve the lot of women and disabled without putting up specific and well resourced interventions is going to remain a developmental pipe dream.

✓ The other two pillars of CSA, viz, CT and CF need greater care and consideration when coming up with milestones during unfavourable climatic and economic conditions. This financial year's achievements were clearly influenced by the adverse conditions. Care should be taken when making attributions and judgements as to the extend to which a programme is successful or under archiving.

5.3 Recommendations

In the light of what has been observed above, this season's adoption study wishes to make the following recommendations:

1. The CSAZ's (CFU) Private sector should continue to explore more and more ways of enabling households to have access to both financial resources and a ready local market for ripping implements.

2. Where potential animal draft power is relatively low, that is, in Central and Western Regions, emphasis should be placed more on basins as well as Tractor ripping and Basins.

3. Even though the CSAZ has now entered its final year, the CFU and DFID could work out a special package and bring about an intervention meant to capacitate women and the disabled so that gender and disability talk does not remain a mere talk.