

# Influence of Literacy on the Smallholder Farmer's Ability to Adapt to Drought in Pallisa District, Eastern Uganda

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## Abstract

Functional literacy if well-applied increases lifelong livelihood opportunities for the smallholder farmers faced with drought episodes. This study examined the influence of literacy on the smallholder farmer's ability to adapt to drought. The social-economic data was collected and analysed using both multi-stage and cross-sectional sampling methods. A total sample of 153 smallholder farmers was randomly selected from Gogonyo, Kameke, Kamuge and Kasodo sub-counties and administered household questionnaires. The study results revealed that there was a very significant relationship between literacy (reading and writing) and adaptation to drought by the smallholder farmers ( $p < 0.05$ ). This was brought about by remarkable functional literacy players. The farmers recognised non-governmental organisations (65%) and farmer associations (20%) as the major contributors of their functional literacy levels followed by the government (15%) through extension programmes. Specifically, community public gathering including public announcements, farmer field schools with 70% and use of visual aids (posters) –(20%) were the major modes of adaptation content delivery to the smallholder farmers followed by the use of electronic media such as radios, television (6%) and use of public documents like newspapers and magazines with 4%. However, the shortfalls in the acquisition of literacy were largely caused by the farmer's nonattendance to the schools and training, insufficient knowledge to comprehend, shortage of scholastic writing materials, trekking longer distances to educational centres and inadequate financial resources to meet their school requirements. Above all, the promotion of reading and writing literacy skills amongst the smallholder farmers is more likely to trigger, improve and lead to the introduction of adaptation innovations that are critical in improving the farmer's resilience and livelihood status.

**Keywords:** Smallholder farmers, drought, literacy, adapt, Pallisa, Uganda

## 1. Introduction

Drought under smallholder agricultural production has many meanings - ranging from statistical (lowest decile of annual rainfall) to reduction in yield limited by too little water and severe water deficits (Passioura et al., 2007). This condition can be caused by natural variability such as El Niño/Southern Oscillation effects, owing to the predilection for wetter land during La Niña events (Trenberth et al., 2014). In terms of occurrence and extent, drought is one of the most frequent and severe climate-related shocks occurring on the African continent, often causing food insecurity (Rojas et al., 2011). Generally, the impacts of drought can be classified as economic, environmental and socio-economic and the same impacts can either be direct or indirect (Zarafshani et al., 2016). The negative impacts of drought on agricultural production vary from very low to very high, depending on regional or geographical location and socio-economic developments of farming societies (Tripathi et al., 2016). Droughts affect agricultural productivity through causing physiological changes in crops, limiting water availability, reduction in soil fertility and increased multiplication and introduction of pests (Apuuli et al., 2002). The smallholder farmers are vulnerable to the drought events because of widespread poverty levels which limit their capabilities to adapt through the acquisition of agro-inputs and technologies (Ogwang et al., 2012). The meteorological drought was the primary focus of this study.

Literacy is the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts (Miléf & Sládek, 2011). Worldwide, more than 796 million people in the world cannot read and write and therefore, the cost of illiteracy to the global economy is estimated at USD \$1.2 trillion which costs results into a cycle of poverty with limited opportunities for employment or

income generation (WLF, 2015). In the developing world, according to Huebler & Lu (2013) adult literacy rates were reported to be below the global average especially in South and West Asia (63%) and sub-Saharan Africa (59%), where more than one-third of adults cannot read and write. In Uganda, the literacy rate among persons aged 10 years and above has increased by 4 percentage points from 69 percent in 2005/06 to 73 percent in 2009/10 though the male literacy rate (79%) was higher than that for females (66%) which reflect a similar pattern to the findings of the 2005/06 survey (UBOS, 2016). Poverty and subsequent lack of access to reading and writing materials are envisaged to be among the major causes of illiteracy (Lauglo, 2001).

The measurement of literacy in Uganda seems to focus more on the “basic literacy” than on the “functional literacy” level. The proficiency test for literacy in adult literacy programmes tests basic reading, writing and numeracy skills in livelihood enhancement (Okech, 2006). In Uganda, the National Functional Adult Literacy Programme (FAL) started in 1996 and by 2002 all the districts had been covered and included in the Poverty Eradication Action Plan with the aim to increase the farmer’s ability to raise their incomes (Okech & Carr-Hill, 2001). Literacy and inadequate basic education deprive the people of the opportunity to realise their potential to achieve their livelihood goals (Gaurav & Singh, 2012). The scope of this study was to understand how the farmers applied their functional literacy to adapt to drought. Functional literacy is the ability to use reading, writing and numeracy skills to stimulate individual and community development (Weir & Knight, 2004; Bangay & Blum, 2010). Literacy was also understood as a process and not as a skill to widen our comprehensive investigation of inputs, methods and outputs of being competent. Literacy is therefore seen as a key learning tool for knowledge, skills, values and attitudes required by human beings to develop their capacities and to participate fully in development (Jamison & Moock, 1984; Appleton & Balihuta, 1996; Okech, 2006).

Many studies have documented the role of literacy in influencing agricultural technological adoption in both developed and developing countries in climate-related studies, however, they fall short of documenting the influence of farmer’s functional literacy abilities to adapt to drought. In addition, quantitative studies in literacy are relatively few compared to qualitative studies though recent nationwide evaluations consider them the methodology of choice (Stromquist, 2006). This paper also further links between literacy and adaptation to drought which has not been inadequately explored worldwide. This study attempts to bridge this information gap by using smallholder farmers as the sample population. The specific objectives of the study were; i) to ascertain the socio-economic characteristics of the smallholder farmers, ii) examine the farmer’s perceptions on drought manifestation, and iii) assess the influence of literacy on the smallholder farmer’s ability to adapt to drought in Pallisa District. The results of this study will provide a broader understanding and benefits of functional literacy and hence provide fertile ground for further research, innovation and progress towards the development of effective literacy programmes for all and community development.

## 2. Materials and methods

### 2.1 Description of study area

Pallisa district is located in the of Lake Kyoga basin and highly prone to drought and flood events depending on the season of the year. This study was conducted in Pallisa District located in Eastern Uganda (Figure 1). The district lies between latitudes 0°45’N and 1°05’N and longitudes 33°47’E and 34°05’E. The district’s surface area extent is about 1,095.1 Sq.km. Pallisa district was selected because of having generally lower (64%) levels of literacy as compared to the other districts (UBOS, 2016). Further, according to Kansime et al. (2013), over 90% of the farmers interviewed had perceived change in rainfall pattern, dating as far back as 10 to 15 years in the district. Climatologically, the district experiences an equatorial type of climate characterized with a bi-modal type of rainfall pattern that occurs twice a year. The average annual rainfall is 900 to 1,500mm with the peaks experienced in March and November of each seasonal calendar year. The major prolonged dry spells are experienced during the December to February period of each seasonal year (Figure 2).

The study area topography is generally flat with an altitude ranging from 1,000- 1,150m above sea level. The soils are composed of three formations: Petric Plinthosols (Acric) composed of grey brown and brown sandy loams; Histosols (Papyrus peat) and Gleysols (undifferentiated alluvium). In terms of water resources, the district is well gifted with both ground and surface water sources that are widely distributed. The main lakes include L. Kadiko, L. Meito, L. Nyasala, and L. Adois among others, while the major rivers include Koburio, Kongolias, Lwere, Kitoikawononi among others. The district is fairly covered with savanna type of vegetation with scattered bushlands that have prevailed for the last 30 years due to climatic conditions and human activities. The savanna vegetation cover types include *Combretum* associated with *Hypermedia* and *Bytyro spermum*. Socio-economically, the majority (95%) of the households are engaged in active smallholder agriculture which is practised throughout the district. This is followed by fishing and engagement in small scale businesses.

## **2.2 Socio-economic data collection**

### **2.2.1 Study design**

This study used both multi-stage and cross-sectional survey methods to collect socio-economic data from the study population in the month of April 2016. This month marks when most farmers are more engaged in smallholder farming activities. The threefold sampling levels included the district, sub-county and village. During the first level, the local government district officials were consulted and interviewed through an organised meeting at the district because of their expertise in literacy, agricultural production and drought adaptation. The selected respondents included the agricultural officials, environment officers, planning officers and education officers. While at the sub-county level, the community extension officers were selected on the guidance of sub-county chief and interviewed from the sub-county headquarters with an intention to learn from their regular interactions with the grassroot farmers. At the village level, the smallholder farmers were the subject of study. These were interviewed using a questionnaire from their homesteads to avoid loss of production time. The smallholder farmers were interviewed and grouped into group discussions to obtain primary data. The designed questionnaire was subjected to validity and reliability. The technical experts in education, agriculture and climate change were consulted to securitize the interview guides prior to field work for additional input into the tools. The study used a test-retest method on pilot farmers to affirm the reliability of the questionnaire.

### **2.2.2 Data collection and analysis**

The performance of functional literacy has been evaluated for a variety of purpose. Two assessments of literacy are prevalent: formal and informal. This study took a formal measure because they are strongly influenced by standardised testing paradigm. A post-literacy performance assessment was conducted on the randomly selected smallholder farmers to document their abilities to adapt to drought. The smallholder farmers made up the most interviewed respondents with no strings attached. A sample of 153 smallholder farmers was selected from Gogonyo, Kameke, Kamuge and Kasodo sub counties using simple random sampling procedures with the guidance of local leaders. The questions were functional in nature and were based on authentic measurement as they relied on real objects, pictures, and posters related to drought and adaptation found in the study area. The questionnaire was designed to collect both qualitative and quantitative datasets. In qualitative studies, literacy gains are important to the farmer's lives while in quantitative studies, gains are measured in standardised tests (Stromquist, 2006). A total of 4 focus group discussions were also conducted from the studied sub-counties during field work, where 10-12 farmers were gathered at the nearest primary school or a common community meeting place for the discussions. This promoted active dialogue and empowerment as literacy circle participants developed their own materials and thereby took ownership of the issues that arose as their skills developed (Lauglo, 2001). This information supplemented the collected data from the questionnaires and key informant interviews. The focus group discussions targeted data on literacy, land size and gender.

In-field data collection, three university students were identified and trained to administer the questionnaires in the sampled sub-counties. The major elements of the survey questionnaire collected included: socio-economic characteristics of farmer's, perceptions on drought, influence and constraints of literacy on the smallholder farmer's ability to adapt to drought. The data was qualitatively and quantitatively analysed. The non-parametric Chi-square test was conducted to test the relationship between literacy and adaptation to drought by the smallholder farmers due to the sample size. The statistical analysis was performed using SPSS software package and results presented in form of tables and charts.

## **3. Results**

### **3.1 Socio-economic characteristics**

Table 1 below shows that the vast majority of the interviewed farmers were married (84%), followed by the widowed, single and those who had separated with their spouses. Marriages are legally qualified for the farmers who are 18 years and above, however, fewer intermarriage was recorded. The females (60%) formed the largest composition of respondents during the study in Pallisa District. In terms of education, most of the interviewed farmers had attained primary education (54%) followed by those who had no formal education, ordinary level education, tertiary education and Advanced level education. Those who had attained primary school training underwent 7 years of classroom participation according to Uganda's curriculum of primary education. The farmers recognised non-governmental organisations (65%) and farmer associations (20%) as the major players that influenced their functional literacy levels followed by the government (15%) through extension programmes. As for livelihood status, crop growing remains the major source of income for the survival of smallholder farmers (86%), followed by those engaged in small-scale businesses and fishing activities. Crop growing is entirely rainfed and characterised with the use of rudimentary tools in the studied area. Whereas in terms of expenditure, a larger number of the respondents (58%) did not spend more than 50,000Ushs per month (14USD); however the study shows that they spent more than what they earned.

Land ownership in the study area was fourfold: Inheritance, renting-in, leasing, and bought-in. Most of the interviewed respondents agreed to have acquired land for both settlement and cultivation through inheritance,

bought, renting, and leasehold. The customary land tenure system prevalent in the district facilitated the transfer of land user rights through inheritance by the males. The mean age of the many of the interviewed respondents was 42 years and on average each household had 5 members staying under one roof. Whereas, the mean household land size was 2 acres which are rooted from the type of land ownership in the study area. In the diversification of different land use types, crop growing covered a relatively higher portion of land compared to both tree plantation and livestock rearing.

### **3.2 Farmer's perceptions on drought manifestation**

The smallholder farmers perceived the occurrence and frequency of drought to have caused a reduction in the crop and livestock yields (48%), water and pasture quality and quantities. The decreases were a threat to the food security of the smallholder farmers (Table 2). While as per the surrounding environment; the farmers observed an increment in the rise of surface temperatures (20%) and continued survival and introduction of new pests/parasites and diseases. Bush burning was also common a habit practised towards the end of the dry season.

### **3.3 Influence of literacy on the smallholder farmer's ability to adapt to drought**

The literacy service providers used several modes of content delivery. Specifically, community public gathering including public announcements, farmer field schools with 70% and use of visual aids (posters) –(20%) were the major modes of adaptation content delivery to the smallholder farmers followed by the use of electronic media such as radios, television (6%) and use of public documents like newspapers and magazines with 4%. The occurrences of functional literacy programmes were largely dependent on the availability of funds sourced from either government or development partners. Literacy is highly beneficial to the smallholder farmer's ability to adapt to the unpredictable drought episodes. Table 3 below shows that there was a high probability of reading and writing to influence the smallholder farmer's ability to adapt to the disastrous impacts of drought. The Chi-square results revealed that there is a very significant relationship between literacy skills (reading and writing) and adaptation to drought by the smallholder farmers ( $p < 0.05$ ). On the other hand, the possession of numeracy skills did not positively influence the farmer's ability to adapt to drought ( $p > 0.05$ ) despite the availability of this content on farm/agro-inputs.

As concerns reading drought adaptation content, most farmers understood what agricultural writing meant in terms of application and dosage of applied agro-inputs (47%) and interpreted the meaning of changes in climatic shocks. This was followed by those who were able to apply instructions as outlined concerning farming practices and interpretation of information on drought. While adaptation underwriting literary; the majority of the farmers were able to record farming activities /eventualities that happened on their farmlands such as dates and quantities of agro-inputs application and expenditures on farmland inputs (55%), followed by those who were able to make documentations such as while applying for farm loans from credit institutions and plans on the implementation of agricultural adaptation practices. On the other hand, numeracy skills did not influence the smallholder farmer's abilities to adapt to drought ( $p > 0.05$ ). However, the majority of the farmers were able to compute the small amounts of money spent on agricultural production in adaptation to drought and monetary profits and losses from farming activities. These were followed by those who borrowed money to increase food production and document farm measurements on their farmlands.

The Cramer's V is an appropriate measure of association to use in summarising relationships. The results further revealed that reading and writing had a very strong relationship or large effect in influencing the smallholder farmer's ability to adapt to drought. However, there was also a strong relationship between numeracy and adaptation to drought (0.527) by the farmers. In summary, the Cramer's V showed that the variables (reading, reading and numeracy) appropriately measured functional literacy levels.

### **3.4 Constraints of functional literacy on the farmer's abilities to adapt to drought**

The smallholder farmers were constrained by a number of on-farm and off farm-literacy related challenges in adaptation to drought in the district. As regards to writing skills, most of the interviewed farmers attributed this inadequacy to nonattendance to active adult training schools (37%) and having insufficient knowledge to comprehend the taught adaptation responses with 26%. This was followed by a shortage of scholastic writing materials and long distances moved by the farmers to the educational centres and lastly inadequate financial resources to meet the literacy requirements. While as far as reading was concerned, the majority of the farmers were constrained by limited exposure to schools, shortage of reading materials and lack of interest in reading adaptation messages. Lastly, for numeracy, the farmers also confirmed that they never had the opportunity to attend the formal educational classes to be able to acquire numeracy capabilities -45% were constrained due to dropping out of school.

## **4. Discussion**

Literacy is an important step towards helping smallholder farmers improves their adaptation efforts to the



frequent and severe drought phenomenon. This point of view was also observed by Lind (2006) that illiteracy prevents smallholder farmers from accomplishing basic business administration tasks like keeping track of production trends or negotiating fair contracts with potential buyers and adopting climate-related adaptation practices. When farmers are unable to write, it becomes impossible for one to access the market, unable to account for their production hence literacy enables farmers to increase their income, adoption of new drought adaptation innovations, produce more profitably and improve their access to markets. In terms of farmer attributes, the majority of the interviewed farmers were married while the female farmers composed the largest number of respondents. This brings about gender inequality, women are the ones who are more engaged in farming activities than the men but they are denied access and control of farmland resources hence hindering development. Literacy skills attained by the majority of the farmers are consistent with the literacy trend in Uganda. The literacy rate among males remained constant at 77.4 percent while that for females increased from 62 in 2002 to 68 percent in 2014 (UBOS, 2016). This is attributed to increased access to both primary and lower secondary levels. However, Pallisa district is one of the districts in Uganda with low proportions at 10.3% and 20.3% respectively of literacy in Uganda as compared to the districts in the Central and Western parts of the country (Ssewanyana & Kasirye, 2012).

While in terms of household income, most of the farmers derived most (85%) of their income from crop growing. The household low incomes levels were also consistent with the country poverty rates for the eastern region. According to UBOS (2016), the median monthly earnings for Uganda increased from Ushs 80,000 in 2009/10 to Ushs110, 000 in 2012/2013. The high expenditure is not consistent with earnings; however, with the introductions of farmer saving groups members are able to acquire loads. This is also in line with the findings of UBOS (2016) that the mean consumption expenditure per capita increased to UShs 50,900 from about UShs 47,200 between 2009/10 and 2012/13 in Eastern Uganda. Land ownership remains a key factor in undertaking crop and livestock activities. The land is largely acquired through inheritance from the parents; however, a large proportion of the farmers buying land are rising; given that fact that some of the farmers had been displaced by the civil strife in early 2000. This mean age is true and consistent for the productive smallholder farmers. The farmer's household size and family members fell within the stipulated national statistics by the national population census for 2014. The total fertility rate was 6.2 children per woman (UBOS, 2016).

The rise in temperature as observed by the smallholder farmers is consistent with the global change in climate. The mean daily maximum temperatures are highest at the beginning of the year (January to March) but decline gradually in April of the season. According to UBOS (2016) the study area falls in the region (Eastern region) with the biggest production of Finger millet (106,838 tonnes), Maize (1,108,554 tonnes), Rice (128,195 tonnes), Sweet potatoes (847,140 tonnes) and Cassava (1,061,186 tonnes), however drought continues to underscore the efforts of farmers engaged in both crop and livestock production. Just like education, literacy empowers and increases one's self-esteem making them more participative in any activity and opportunities available to them. The 2014 National Population and Housing Census showed a two percent increase (from 70 percent to in 2002) in the literacy rate among persons aged 18 years and above in Uganda. The literacy rate among males remained constant at 77.4 percent while that for females increased from 62 in 2002 to 68 percent in 2014. Interpreting changes in climate by the farmers was not expected. There was a very strong statistically significant relationship between literacy (writing and reading) and adaptation to drought. The significant literacy skills highly contributed to the adaptation to drought by the farmers through carrying out micro-irrigation, planting drought tolerant crop/pasture varieties, tree planting, soil conservation, early and late planting and hay growing. However, there was a strong relationship between numeracy and adaptation to drought (0.527) by the smallholder farmers.

For the smallholder farmers who were not able to write, it was largely attributed to nonattendance of any formal education. This result was expected because writing is a skill developed during class attendance. The farmers did not as much concentrate on using their writing skills while adapting to drought rather than they concentrated on the methods or other strategies of adapting to drought. The farmers used writing skills in recording the quantities and dates of fertiliser and pesticide applications in crop production- as coping responses to the introduction of new pests and diseases and reduced soil fertility due to drought. This is evident with Osiru (2011) who also reported that the farmers were trained appropriate methods of farming, agroforestry, soil and water conservation, water shade management, marketing, post harvesting, saving and microfinance among others. This meant that there was a lack of sensitization of the farmers on the importance of literacy. It also brings out the negative attitude the respondents had towards literacy. In additional, household income was not a significant factor in delimiting farmer's efforts to attain writing skills. Farmers who had limited reading skills never attended formal school education. Those who are using reading skill were able to do so because of their early education rather than the training carried out. Longer distances to schools, accessibility, poverty, insecurity and school ownership (government or private) played a great part in hindering the farmers from attaining school education. A relatively smaller number of farmers were not interested in reading (19%) drought adaptation materials. This result was not expected but the farmers attributed it to the poor packaging of the content on

adaptation practices and quality of the content. This was also pointed out by Openjuru & Lyster (2007) who also observed that literacy programmes in Uganda are faced with limited funding, an inadequate number of instructors and literacy materials, and inadequate training facilities.

Furthermore, the numeracy skills were the least utilised in the adaptation to drought by the farmers due to school drop and insufficient knowledge. Proportionate numbers of farmers dropped out of schools. The high school dropouts were attributed to mainly social and economic factors such as lack of school fees, marriage and distant schools. This shows that numeracy literacy while adapting to drought was found irrelevant and there was no mobilisation and sensitization of farmers to learn and use this skill. This is also in agreement with the findings of Ampaire and Rothschild (2010) who noticed that smallholder farmers cannot practice what they were trained in because they lacked finances to purchase various resources. Another reason for the above constraints was due to limited access to reading materials which were scarce or not available to them. In conclusion, basing on the findings of this study, it is worthy to conclude that literacy was found to be a relevant step forward to the farmer's ability to adapt to drought.

### Conclusion

Literacy levels attained by the majority were consistent with the literacy rates in Uganda. The reported mean age (42) is true and consistent for the productive smallholder farmers. The farmers majorly perceived the manifestation of drought to include an increase in temperature and decrease in agricultural yields. Statistically, there was a significant relationship between literacy skills (reading and writing) and adaptation to drought by the smallholder farmers. The significant literacy skills highly contributed to the adaptation to drought by the farmers through carrying out micro-irrigation, planting drought tolerant crop/pasture varieties, tree planting, soil conservation, early and late planting and hay growing. The Cramer's V results revealed that reading and writing had a very strong relationship or large effect in influencing the farmer's adaptation to drought. However, there was also a strong relationship between numeracy and adaptation to drought (0.527) by the farmers. However, from the constraint point of view, most of the interviewed farmers attributed to literacy inadequacy to nonattendance to school, having insufficient knowledge, shortage of writing materials, long distances to education centres and inadequate financial resources. Literacy skills (especially reading and writing) increased the smallholder farmer's opportunities to adapt to drought. Therefore a national literacy policy is a necessity if the farmers are to comprehensive benefit from literacy programmes. In addition, to avoid duplication of services by government, adult learners need to acquire certificates recognising a level of literacy competencies equivalent to formal schooling. Also, promoting literacy amongst smallholder farmers is likely to trigger the introduction and implementation of drought response and livelihood support programmes. In addition, if the government and development partners can succeed in improving the farmer's literacy efforts with climate change adaptation efforts then the food security status is likely to flourish.

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**Tables**

**Table 1: Household socio-economic characteristics**

<b>Socio-economic characteristics</b>	<b>Percent</b>
<b>Marital status</b>	
Married	84
Single	4
Separated	2
Widowed	10
<b>Gender</b>	
Male	40
Female	60
<b>Education level</b>	
Non-formal education	20
Primary	54
O-level	18
A-level	2
Tertiary	6
<b>Major source of income</b>	
Crop growing	86
Fishing	2
Small scale business	12
<b>Monthly household income (Ushs)</b>	
< 50,000	58
50,000-100,000	34
100,000-500,000	8
<b>Monthly expenditure (Ushs)</b>	
< 50,000	26
>100,000	28
50,000-100,000	22
Not sure	24
<b>Land ownership</b>	
Inheritance	57
Renting	9
Lease	2
Bought	32
<b>Household characteristics</b>	<b>Mean</b>
Age	42
Household size	5
Household land size (acres)	2
<b>Size of land under use</b>	
Crop growing	1.6
Livestock rearing	0.25
Tree plantations	0.75

**Table 2: Farmer's perception on the manifestations of drought for the last 10 years**

<b>Drought manifestations</b>	<b>Increase</b>	<b>No change</b>	<b>decreased</b>	<b>Don't know</b>
Temperature	20.0			
Pests/parasites and diseases	4.6			
Crop/livestock yields			48.0	
Pasture quality and quantity			9.0	
Water quantity and quality			10.0	
Bush burning	4.6	4.0		



**Table 3: Literacy levels on adaptation to drought by the smallholder farmers**

Literacy skills	Adaptation options	Percent	P values	Cramer's V
Reading	Ability to understand what agricultural manuals meant	47	0.057**	0.601
	Ability to interpret meaning of changes in climate	26		
	Ability to understand the impacts of information on drought	11		
	Ability to follow instructions concerning farming practices	16		
Writing	Ability to write records on what is produced	55	0.021**	0.685
	Ability to sign for money at the credit institutions	22		
	Ability to write a farm based plan to guide farming activities	23		
Numeracy	Ability to compute monetary profits and losses from agriculture	38	0.252*	0.527
	Ability to compute amount of money to spend on agricultural production	43		
	Ability to borrow money to increase/diversify adaptation options	10		
	Ability to make right measurements when carrying out agricultural practices	9		

\* Not significant at 5% level of significance

\*\* Significant at 5% level of significance

**Table 4: Constraints of literacy in adaptation to drought**

Constraints	Percent
<b>Writing</b>	
Lack of scholastic writing materials	19
Never went to school	37
Long distances to educational centres	15
Inadequate financial resources	4
Insufficient knowledge of farmers to comprehend	26
<b>Reading</b>	
Limited reading materials	20
Never went to school	48
Never been taught how to read	13
Not interested in reading	19
<b>Numeracy</b>	
Never went to school	55
Dropped out of school	45

