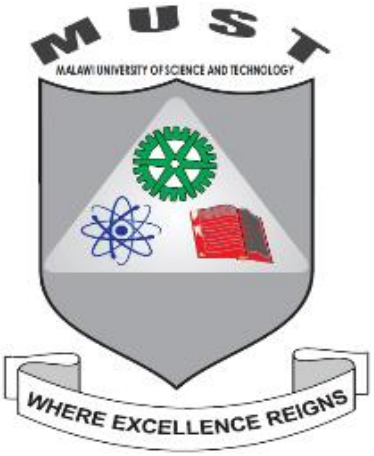


EXPLORING THE MODES OF COMUNICATING CLIMATE INFORMATION USED BY DEDZA AGROMETEOROLOGICAL STATION IN CHAFUMBWA EPA

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ABSTRACT

Malawi, a developing country in the tropics largely depends on rain fed agriculture for its economy as well as food security. Agriculture being vulnerable to variable weather and climatic shocks and hazards requires a vibrant and effective agrometeorological sector to act in response to as well as act in anticipating challenges the country may get into due to climate change in as far as agricultural production is concerned. Agrometeorology as a science, may be useful in minimizing agricultural losses during both the production process and storage as well as improve production through issuing of weather forecasts, early warning information as well as decision support information. Although the Agrometeorology sector exists under the Department of Climate Change and Meteorological Services (DCCMS), the country still battles agricultural losses brought about by weather and climate variability hazards such as floods and dry spells. Therefore, it was the purpose of this study to explore the modes employed by Dedza agrometeorological station when communicating climate information to farmers in Chafumbwa Extension Planning Area (E.P.A). The study focused on collecting data on communication channel between DCCMS to farmers through the agrometeorological station and Agricultural Extension Development Office, the user friendliness of the information and the information conveyance timing. The collected data had to be analyzed qualitatively using content analysis. The results showed that the agrometeorological station predominantly uses verbal category of communication in transmitting weather updates, early warning as well as decision support information to farmers. The channels trusted and mostly used by the farmers were found to be the A.E.D.O as well as the community radio station (Bembeke FM). The study was useful in offering guidance in areas where improvements ought to be made to ensure that the district agrometeorological station is fully functional in its quest of delivering agrometeorological information to farmers within the EPA. The study recommended that other studies be conducted due to the fact that the results may have been skewed based on the sampling method used which would have identified homogeneous clustered respondents.

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ACRONYMS/ABBREVIATIONS

DCCMS	Department of Climate Change and Meteorological Services
A. E. D. O.	Agricultural Extension Development Officer
E. P. A.	Extension Planning Area
MVAC	Malawi Vulnerability Assessment Committee
Agromet.	Agrometeorology/agrometeorological
UNDP	United Nations Development Program
WMO	World Meteorological Organisation
NOAA	National Oceanic and Atmospheric Administration
DADO	District Agricultural Development Office
DCPC	District Civil Protection Committee
PICSA	Participatory Integrated Climate Service for Agriculture
NMC	National Meteorological Centre

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1. CHAPTER ONE-GENERAL INTRODUCTION

1.1 Introduction

Agrometeorology is defined as the science investigating the meteorological, climatological, and hydrological conditions which are significant to agriculture due to their interaction with the objects and processes of agricultural production (Mavi & Tupper, 2004). The World Meteorological organization (WMO) in conjunction with the United States National Oceanic and Atmospheric Administration (NOAA) conducted a workshop in 2001 to evaluate and asses the then current status of agrometeorological bulletin preparation and to determine different methods to improve the contents of the bulletins to facilitate timely and efficient operational farming decision making that relies on agrometeorological information (Attri, S. D., Rathore, L.S., Sivakumar, M. V. K., & Dash, S. K., 2011). This emphasized on the importance of agrometeorological information sharing.

Sivakumar notes that there is a greater need for agricultural meteorology services to counteract the adverse effects of varying environmental conditions and climate fluctuations. A need to understand effects of weather and climate variability on the developmental rate, growth and yields of rain fed crops is of greater importance (Sivakumar, 2015).

Czaczyk (2012) observes that regional agrometeorological stations in Poland are a technical base necessary for the functioning of the agrometeorological shield within the specific region of the country. This is in connection with what Stigter, C., J. notes in (WMO, 2011) that, it is very necessary that the establishment of the agrometeorological services be guided at the lowest level, in that case, citing the village. This is so because, for Decision Support Systems (DSS), data should be measured near the cultivated crops and farms which are far from urban areas (Czaczyk, 2012). The success of agriculture in Australia may be attributed to among other things the production of a specialized weather forecast for agriculture known as FARMWEATHER by the states' Bureau of meteorology through its special services units located at each state capital (Mavi & Tupper, 2014). All these factors

are just testifying how useful weather and climate information plays a pivotal role in agricultural production.

1.2 Background

The agricultural sector continues to battle wastage and losses brought about by short-term variability and sudden weather hazards directly or indirectly such as flash floods and scanty rains or dry spells. These losses, both on and off farm, may be minimized and avoided through timely dissemination of accurate weather and climate forecasts by meteorologists in designated districts of the country linked to the National headquarters and agricultural extension agents together with the farmers themselves.

This had to call for the establishment of district agrometeorological stations to support the growing need and to offer a link by narrowing down the channel of communication between farmers and the DCCMS. The same had scaled up the network coverage for meteorological data collection points for better ensemble outputs to enhance the quality of meteorological information produced.
In support of the same, The Department of Climate Change and Meteorological Services (DCCMS) with support of the United Nations Development Programme (UNDP) embarked on a data digitization process for climate and weather data spanning in 2018. This aimed at 'scaling up early warning and climate information systems in targeted areas' to improve development planning and reduce economic risks. The information was also to be used by subsistence farmers and fishermen to plan planting strategies, crop types, application of agricultural inputs and navigate stormy weather (UNDP Malawi, 2018).

Although that is the case, most farmers in Dedza, Chafumbwa Extension Planning Area (E.PA.) are still encountering losses brought about by weather and climate-related variability hazards.

1.3 Problem Statement

Smooth information flow from central agencies to the basic beneficiaries, in this case, farmers, are enhanced through proper hierarchical structures. In the country, links connecting meteorological and agricultural agencies in their efforts to offer advice to farmers on weather-related risk are available. There exist twenty-one principally manned agrometeorological stations in the country, of which one is found in Dedza (metmalawi, 2021). These have connections with E. P. As. through the District Agricultural Development Offices (D.A.D.O) which interact directly with the farmers.

Ideally, one would assume and have surety that the presence of the agrometeorological station means that it is fully functional and achieves the purpose of its establishment. However, there seems to be a problem in terms of information communication between the generators, who are the meteorologists and the end users, farmers. In Dedza, while the agrometeorological station flourishes, farmers continue to battle wastage and losses brought about by short-term variability and sudden weather hazards directly or indirectly such as flash floods and dry spells. This is justifiable by the assessment report written by the Malawi Vulnerability Assessment Committee (MVAC) in 2015. The report revealed that about 13,428 individuals from Chafumbwa E.P.A, Traditional Authority Pemba and Senior Chief Chilikumwendo were affected by dry spell which affected agricultural production (Government of Malawi, 2015).

At a national level, the government noted after a feasibility study conducted with support from the United Nations Development Programme (UNDP) that generally the DCCMS is failing to provide the necessary information to the general public due to understaffing and lack of infrastructure (Malawi Government, 2015).

It is therefore the purpose of this study to find out the ways through which the agromet. office transmits information that it generates or receives from the DCCMS to farmers for agriculture production. This will be mostly in terms of

communication channels, the data types conveyed to farmers, user-friendliness of the information and the timing of information conveyance.

1.4. Main and specific objectives

1.4.1 Main objective

To explore the modes of communication used by Dedza agrometeorological station

1.4.2 Specific objectives

1. To assess the communication channel between DCCMS, District Agrometeorological station, Agricultural Extension Offices and farmers.
2. To assess the weather and climate information's user-friendliness.
3. To assess the timing of information conveyance from the Agrometeorological station to the farmers.

1.5 Research questions

a). How does information from DCCMS reach local farmers?

b). How user-friendly is the information?

c). How often do farmers receive weather and climate-related information?

1.6 Significance of study

Upon finalising the study, it would explain how the district agrometeorological station communicates climate information for the purpose of agricultural production in Chafumwa. This would offer guidance on areas which need improvement so that the station should be fully functional and operate to effectively meet the demands and needs of the people in the area in terms of agricultural productivity whilst reducing losses in both on and off-farm activities.

2 CHAPTER TWO-LITERATURE REVIEW

2.1 Proper information channels, decision making and loss minimization

The functioning of a regional or areal agrometeorological system requires the cooperation of various institutions (Czaczyk, 2012). This is in line with what Stigter expounds that agrometeorological services can only prosper in areas where a 'service culture' exists. Among other things, he mentions communication channels as one of the prerequisites for the blossoming of the service (WMO, 2011). He continues to state that, "it is very necessary that agrometeorological services be guided at the lowest level", in that case, citing the village. This is so because, for Decision Support Systems (DSS), data should be measured near the cultivated crops and farms which are far from urban areas (Czaczyk, 2012).

As an example, in the Philippines, it was discovered that the productivity of a region in a particular farming operation increased by the reduction of many kinds of losses brought forth by unfavourable climate and weather and more rational use of labour and equipment. With this in mind, the agrometeorological service in the country is trying to provide information necessary to deal with the same so as to assist farmers in their day to day operations (WMO, 2011).

In terms of decision making, agrometeorological results allow for customization of the working parameters of the sprayer as an example, preventing spraying during negative phenomena. Also, it is possible to predict yields, hence having an influence on the choice of varieties to grow (WMO, 2011).

2.2 Data type and user friendliness

A weather forecast includes parameters like amount and type of cloud cover, rainfall, maximum and minimum temperatures, dew point temperature, wind

speed and direction and relative humidity. It may also include extreme events such as heat waves and cold waves, hail, thunderstorms, floods, cyclones and frost. These and more other weather parameters have profound influence on crop growth, development and yields. Also, increased potential for theses hazards poses challenges for farmers and makes it less feasible for farmers in certain regions to continue crop and animal production (Agwu, E., Amadu, F., Morlai, T., Wollor, E., & Cegbe, L., 2011).

Accurate scientific facts are a necessary condition for good science communication but are not sufficient for effective public engagement (Corner, A., Shaw, C. & Clarke, J., 2018). Stigter argues that most agrometeorological products and services remain unused due to the complexity of the information, inconveniences, unsuitable weather and climatic data, interpolation needs as well as none-existing or not yet most suitable communication channels (WMO, 2011). This results in the products' end users' 'psychological distancing', choosing rather to ignore the communication, perceiving it to be not personally relevant (Corner, et all, 2018). Therefore, there is need to transition from scientific validation to real world application (WMO, 2011).

Also communications need to be 'framed' in a particular way to make it user friendly and acceptable by the users for productivity's sake. To achieve this, presenting information in a narrative format would offer meaningful engagement with science as lay men are more used to communicating through stories than graphs and figures (Corner, et all, 2018). The WMO recommends that there need to be specialized training of agrometeorologists (World Bank, 2015) for the purpose of achieving the same.

3 CHAPTER THREE-METHODOLOGY

3.1 Study area

The study was conducted in Dedza, Chafumbwa Extension Planning Area (E.P.A.). Dedza is a district found in central Malawi. It is situated in the neighbourhood of Ntcheu, Lilongwe and Moçambique. Its geographical coordinates are 14° 22' 0'' South, 34° 20' 0'' East (Maplandia.com, 2016). The area was selected due to the availability of backing literature on the problem. Figure one below shows the study area map.

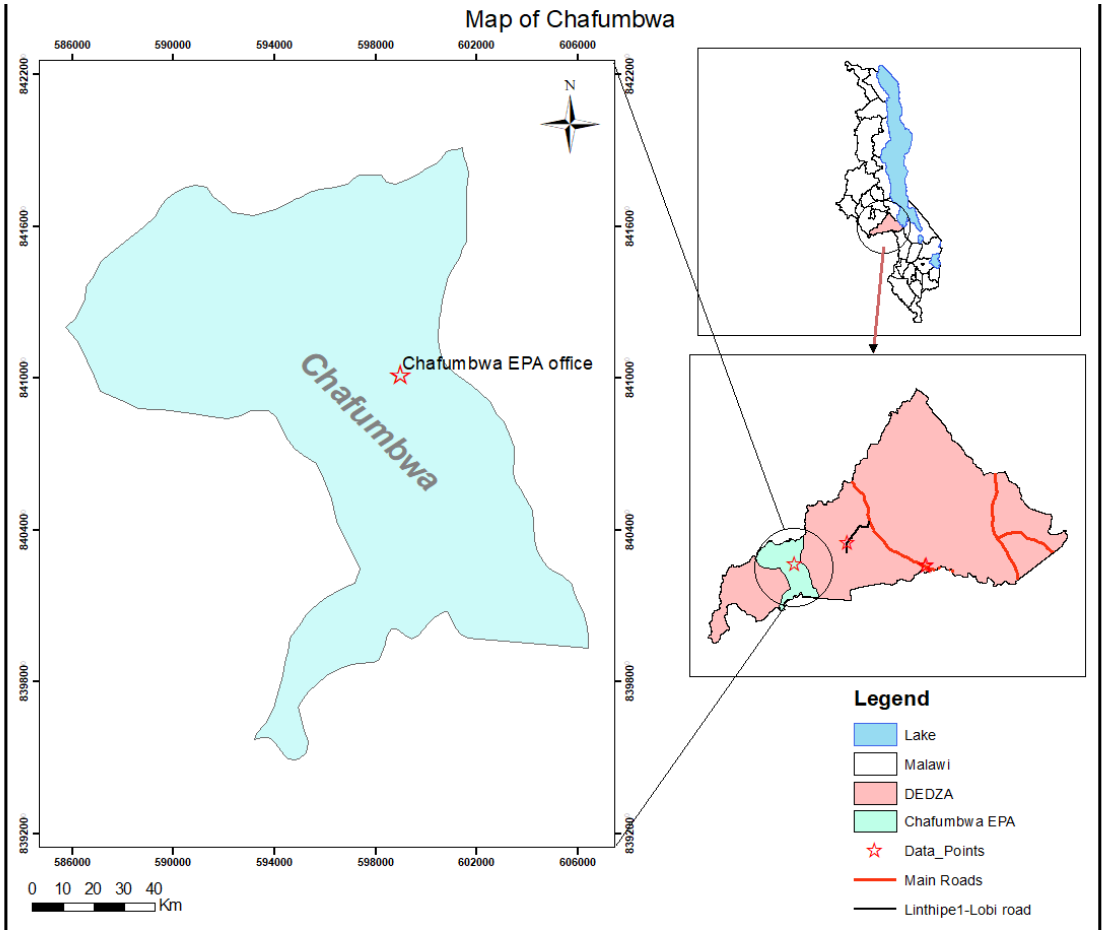


Figure 1: Study area map

3.2 Research design

The study took an exploratory approach. It sought to explore the modes of communication used by Dedza agrometeorological station in communicating climate information to farmers in Chafumbwa E.P.A. This is in terms of agricultural

productivity as well as advisory services in regards to weather and climate. The study involved non probability sampling where purposive sampling was combined with snow ball sampling to identify eight farmers and two officers, one from the Agricultural Extension Services and another from the District Agrometeorological Office. The sampling technique was chosen because it is cheap, simple and cost-efficient. Also, with a small sample, generalizations about a population is possible using the combined techniques. The study involved two sets of questionnaires and interviews to get primary data on the communication channel between the DCCMS, agrometeorological station, E.P.A. office and farmers. A senior Assistant Meteorologist, an Agricultural Extension Development Officer (A.E.D.O) as well as eight farmers were subjected to a structured questionnaire. One questionnaire was addressed to the two officers, from agrometeorological as well as extension offices respectively. The other questionnaire was addressed to the farmers. The same was used to find out timing of information conveyance between farmers and the agrometeorological station.

3.3 Method section

To achieve the proposed objectives for this study, the following were some of things which had to be done. These include: Desk work, field preparations, data collection, infrastructure assessment and analysis of the collected data and presentation.

3.3.1 Desk work

This involved planning the activities to be undertaken in the field. Materials to be used in the field were gathered. These include; reference topographic map made by ArcMap software, questionnaire formulation and printing, a rim of paper, pens, pencils and pencil sharpener, an eraser and a GPS plus batteries. Ethical clearance from Malawi University of Science and Technology Research Ethics Committee (MUSTREC) was also solicited and a consent form issued.

3.3.2 Field work

The major task taken during field work was data collection. Sampling was done purposively through snow ball sampling where one farmer was identified and they identified their colleagues within three villages of Chafumbwa, Kamtambo and Kam'busa in the area of Senior Chief Chilikumwendo in the E. P. A. A total of eight farmers were scheduled to respond to the questionnaire. An Agricultural Extension Development Officer (AEDO) from the E.P.A. and a Senior Assistant Meteorologist from the District Agrometeorological office were also subjected to a structured questionnaire.
Geographical coordinates were taken using a GPS. The coordinates were mainly used to determine the vicinity of structures like roads to offices.

3.3.3 Data management and analysis

The collected data was transferred onto an excel sheet. Some of the data was stored in excel while data points for geographical coordinates had to be converted into (CSV) comma delimited file and then exported to ArcMap for map making and analysis. Bar graphs and stacked charts were also produced by Microsoft excel.

Data analysis was done using content analysis as most data were qualitative in nature. Under content analysis, four major steps had to be undertaken such as data transcription- reading the data several times to get meaning out of it, revisiting objectives- identifying questions that can be answered by the collected data, developing framework- coding or indexing broad themes and identifying themes- looking at the most common responses.

4 CHAPTER FOUR-RESULTS AND DISCUSSION

The research aimed at investigating the modes through which Dedza District Agrometeorological Station communicates climate information to farmers in Chafumbwa E.P.A. Literature has it that farmers in the E.P.A were impacted by a dry spell leading to the affected households requiring aid whilst forecasters were in the district whose duty is to issue warnings and provided necessary advice for adaptation and mitigation to the anticipated weather and climate-related hazards. The research emphasized on finding out how information from DCCMS reach local farmers, the information's user friendliness in the end users' perspective and timing of information conveyance from the central agency to the grass root beneficiaries. The following were the findings from the analysis.

4.1 Communication channel

From the findings, it was discovered that verbal communication was the predominantly used category for communicating weather and climate information from the DCCMS to the farmers. All the three kinds of respondents (Farmers, A.E.D.O and Meteorologist) claimed to have used this category through different platforms and channels. The Agromet. office also receives information from the DCCMS in digital as well as written formats. Figure two below shows a chart which shows the results of category of communication as well as channels of communication used by the two offices to either send or receive information.

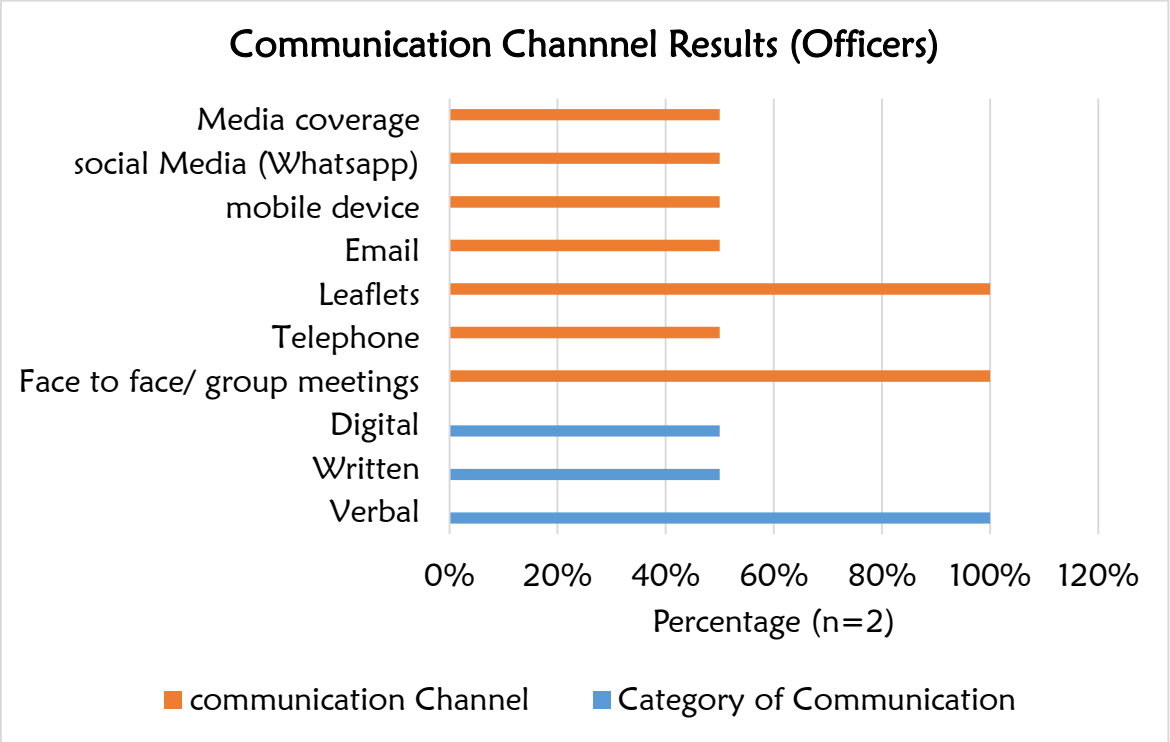


Figure 2: Graph showing communication channel results from officers

The figure shows that beside verbal being the prominent category of communication, the two offices also use written as well as digital categories.

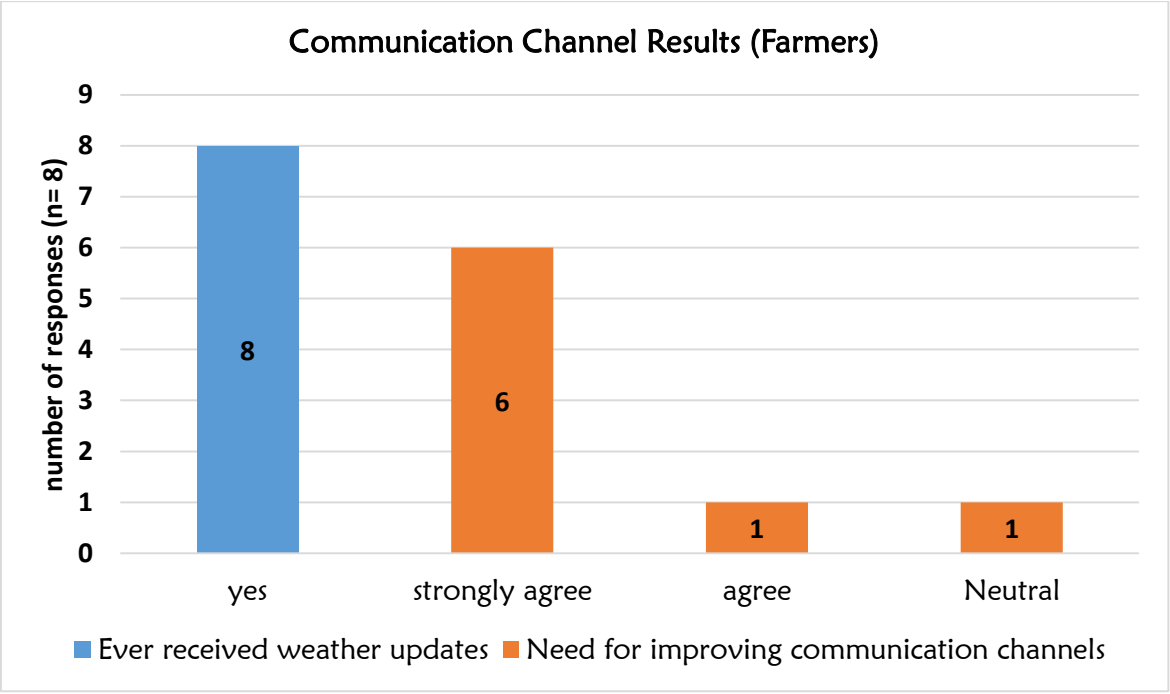


Figure 3: Communication channel results from farmers

From figure three above, 100% of the farmers agreed to have ever received weather updates or climatic information regardless of the channel used to access the same. Although this was the case, 75%(6 out of 8) of the farmers strongly agreed that the channels needed improvement.

Figure five below is a bar graph showing different channels used by the farmers to get climate information.

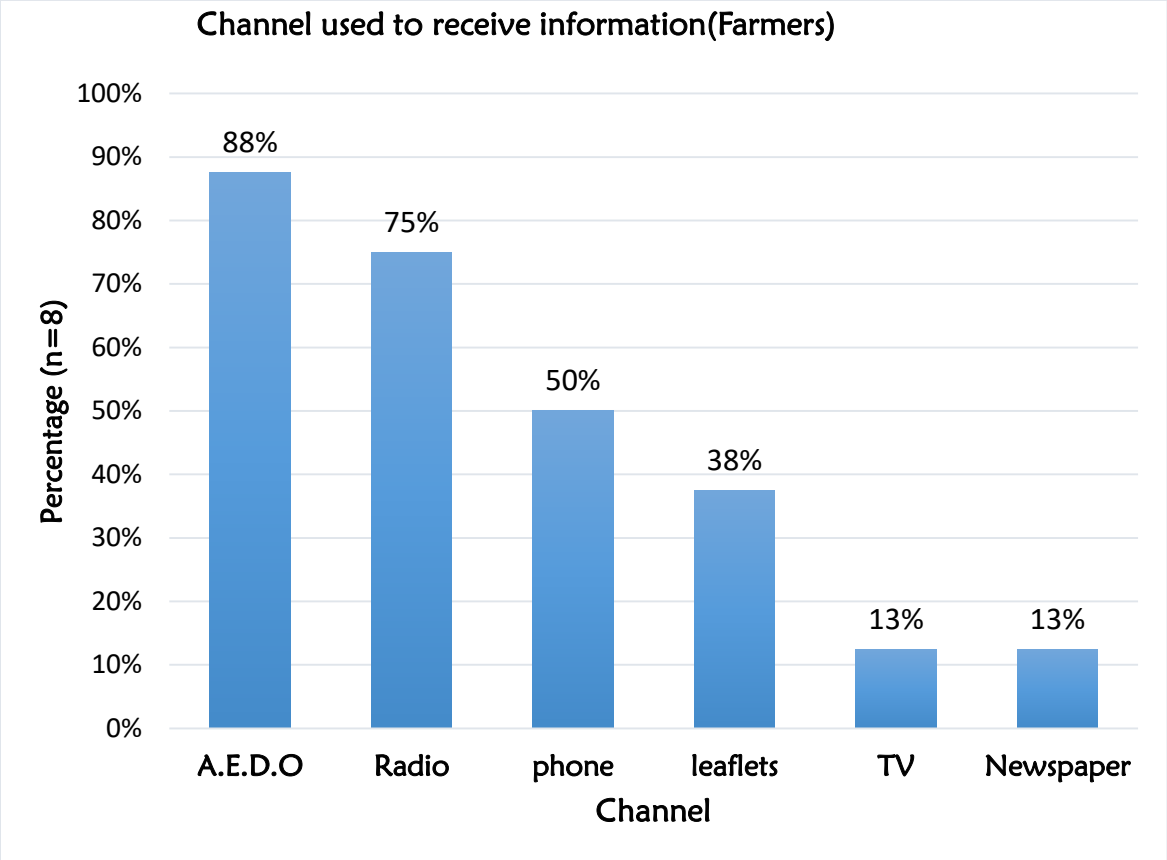


Figure 4: Bar graph showing communication channels used by farmers to get information

From these findings out of the two clusters, it was discovered that **face to face meetings** either through one-on-one or group meetings were the most common media channel both used and trusted by the end users. This was possible through engaging lead farmers, community leaders as well as district structures such as District Civil Protection Committees (D.C.P.C). The A.E.D.O claimed to have been frequently using group meetings because it is one of the easiest way to engage farmers as most of whom are illiterate hence would find it difficult to interpret and

use information on other channels of communication such as Social media (WhatsApp).

Use of the **Community Radio (Bembeke FM)** to communicate updates was also trusted and mostly used by farmers to get the updates. The choice of utilizing the community radio was that it is easily accessible to the communities.

Other channels used were the phones and social media, and leaflets which the Met. Department sends to the farmers through the A.E.D.Cs and A.E.D.O showing seasonal forecasts.

The officers encounter a number of challenges when using the said channels, some of which include low literacy levels for most farmers thereby rendering them unable to use some of the presented materials. Also mobile network coverage is poor in some areas mostly those bordering Mozambique. This makes it difficult for offices to send information through mobile phones. The road network actually is also not in a very good condition as most roads within the E.P.A are seasonal, thereby affecting communication for roving agents during the rainy seasons as they are mostly difficult to use. The researcher found out that from Chafumbwa E.P.A office, the nearest tarmac road towards the agromet. office is at Thete, which is approximately at a displacement of 18 kilometres away.

4.2 Information's user friendliness

Upon soliciting the contents of the information sent to farmers from the agromet. Office, these were the findings.

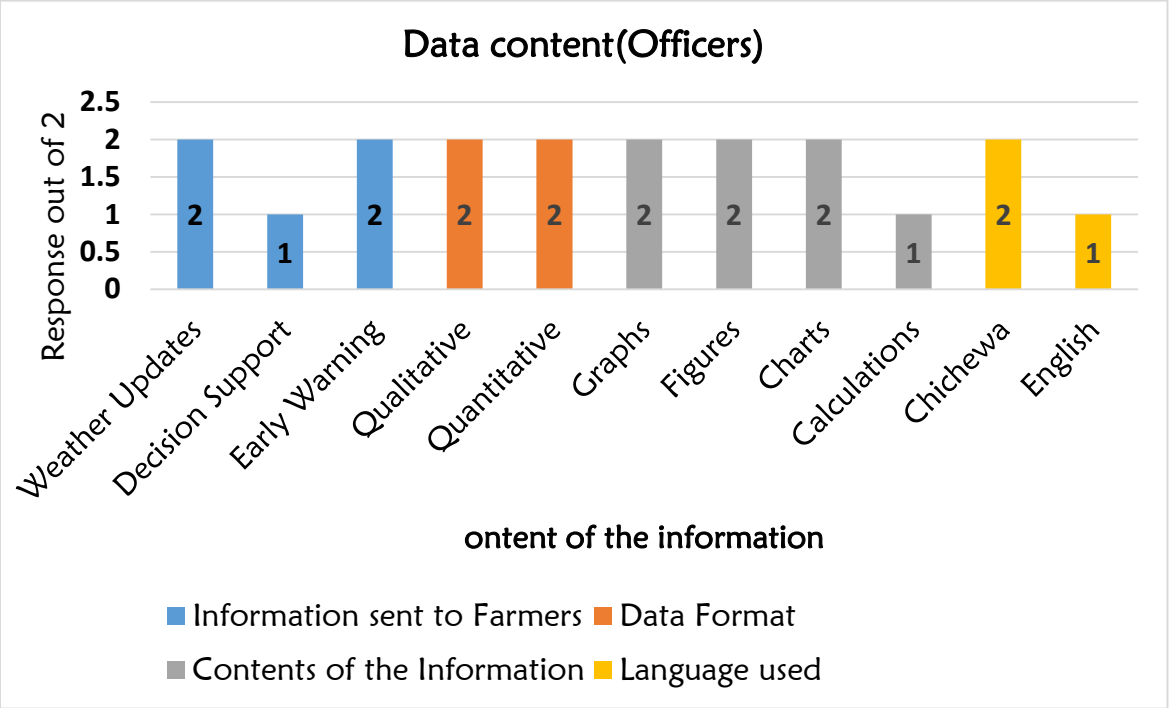


Figure 5: Bar graph showing data's content

It was found that both offices send out weather updates as well as Early warning information. Both offices send qualitative as well as quantitative data which contains graphs, figures, charts as well as calculations. Both offices use Chichewa for communicating their messages while the agromet office, uses English in addition to the local language due to some terminologies which are difficult to translate.

On the farmers' part, the following were the findings.

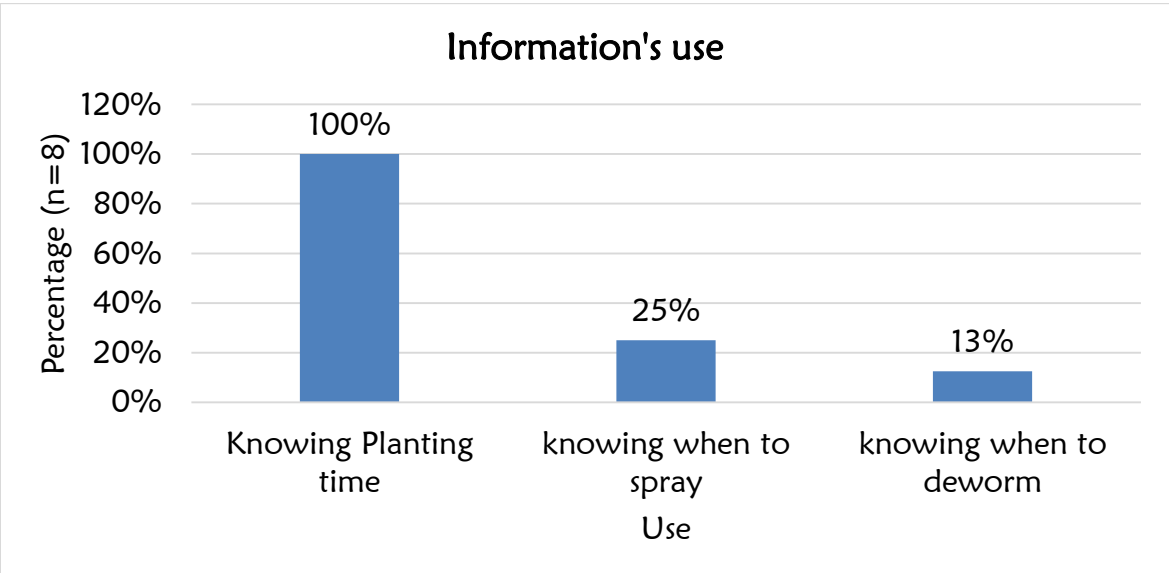


Figure 6: Graph showing decisions that are derived from received communications.

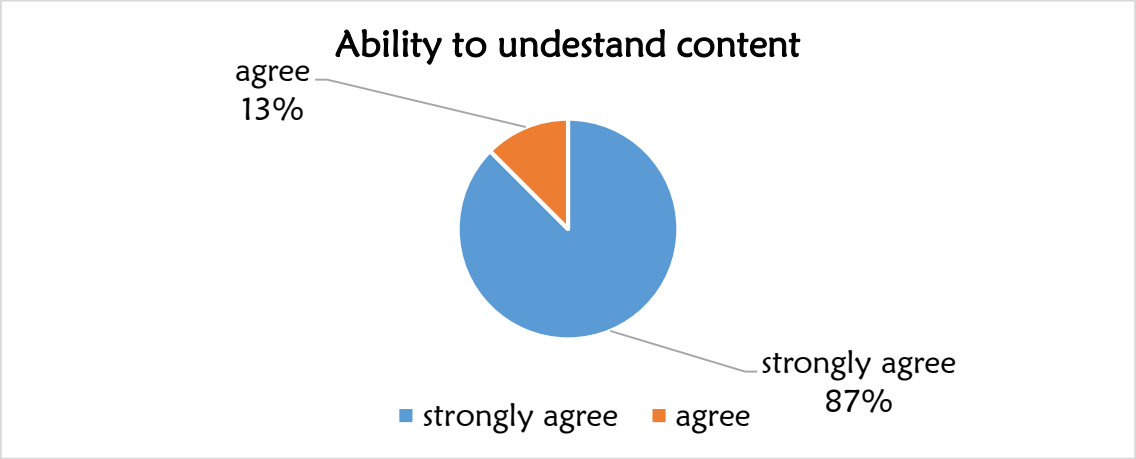


Figure 7:Pie Chart showing farmers' ability to understand presented content.

All farmers who took part in the research agreed to have understood the content presented to them in all formats that they receive on production as well as early warning. The relevance of the information was that it had helped them to determine the planting time, about 100%, knowing when to spray chemicals to crops (25%) and determining the best time to conduct a deworming exercise for livestock farmers (13%).

The researcher also discovered that the farmers who were respondents had undergone training to understand climatic data for agricultural production conducted by a project known as **MCLIMES.**

To ensure that the end users grasp the provided content, the offices employ a number of tactics. First of all, the agromet. Office uses the **Participatory approach,** where farmers are involved generally beginning from their local knowledge on weather and climate. Furthermore, the office holds yearly trainings for A. E. D. Cs and A. E. D. Os termed **Participatory Integrated Climate Service for Agriculture (PICSA).** The A.E.D.O split the farmers into small groups and then train them for a short period, usually one to two hours during their meeting to help them understand.

4.2Timing of information conveyance

On timing of information conveyance, the agromet. office claimed that how often communication is made to farmers and the agricultural department depends on the type of data. **Daily** weather forecasts are sent to different stakeholders directly from the National Meteorological Centre (NMC). Also, the office forwards the same communication to different offices within the district including agriculture. There is also an issuance of a ten-day forecast also known as **Decado.** The A.E.D.O stated that they meet farmers on a monthly basis. Early warning information is sent through the community radio as well as engaging District structures such as District Civil Protection Committee (D.C.P.C) as well as Areal Civil Protection Committees. The research found out the following from farmers:

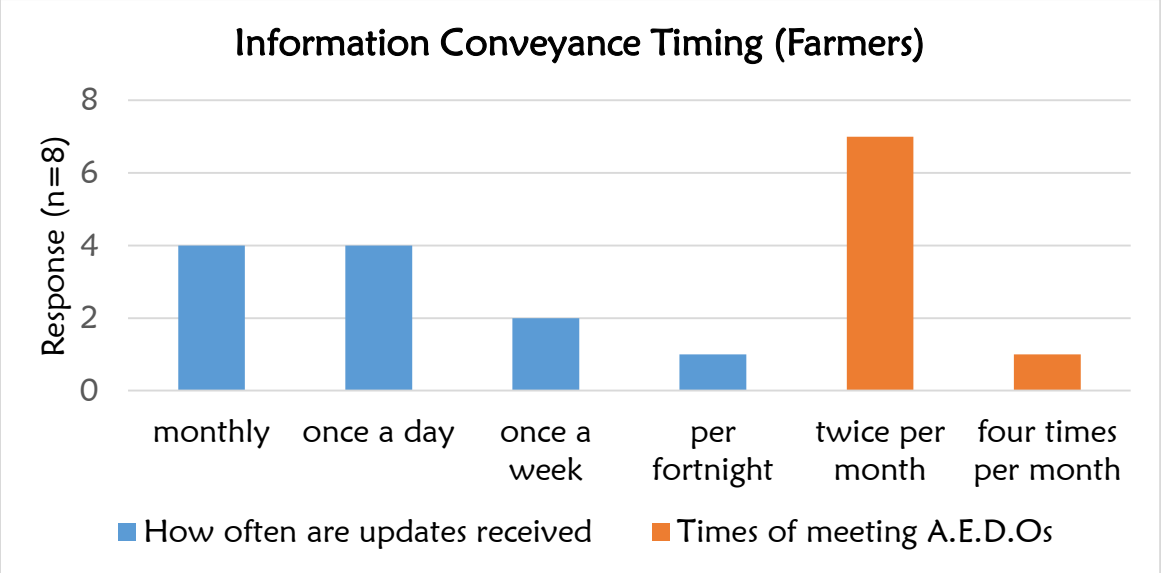


Figure 8:Stacked chart showing responses from farmers on information conveyance

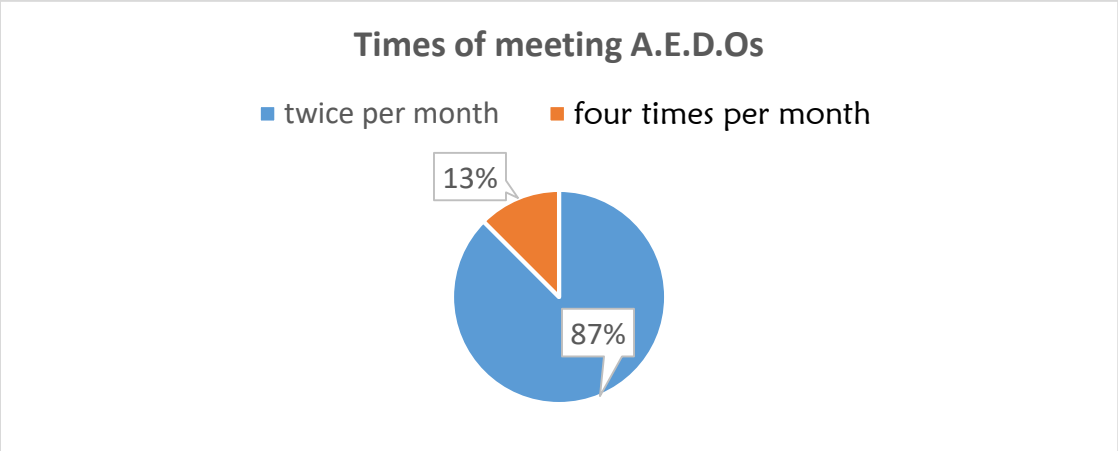


Figure 9:Pie Chart showing responses from farmers on times of meeting AEDO.

7 out of 8 farmers concurred with what the A.E.D.O had stated that they held meetings on a monthly basis. This was also backed by their responses and the results showing that monthly updates were ranked first together with daily updates mainly from the community radio station (Bembeke FM) at 50%. Only one farmer stated that they did receive updates per fortnight.

All farmers wished that the timing be improved. Having in mind that the trusted and most convenient channel of receiving weather and climatic updates were the A. E. D. Os, most farmers wished that the meeting times be improved and narrowed since the gap is huge.

5 CHAPTER FIVE-CONCLUSIONS AND RFECOMMENDATIONS

5.1 Conclusion

The study aimed at exploring the modes of communication employed by the Dedza District Agrometeorological station in Chafumbwa E.P.A. To achieve this purpose, both qualitative and quantitative data on communication channel, the information's' user friendliness and timing of information conveyance had to be collected. The collected data had to undergo qualitative analysis through content analysis. The major outcomes for this research were:

- Mostly, verbal communication was the trusted and most used category of communication through which information generated from the DCCMS reaches local farmers for weather updates, decision support as well as early warning through the Agromet. office. This gets channelled to the end users through the A.E.D.O, in a face to face meeting, who, according to the findings were ranked first at 88% followed by the community Radio (Bembeke FM) at 75%, mobile phones at 50%, leaflets at 38% with the Television and Newspaper being the least channels at a 13% tie.
- The Agromet. office transmits agrometeorological data in Both English and Chichewa for decision support as well as general Weather Updates at daily, as well as fortnight (Decado) intervals but Early warning messages are transmitted per the urgency they deserve. The radio station ably delivers the information on a daily basis and farmers agree to get the information. Meanwhile, the A.E.D.O who are the most trusted channel by the end users only meet farmers monthly.
- The Agromet. office ensures training of A. E. D. Cs and A. E. D. Os yearly through Participatory Integrated Climate Service for Agriculture (PICSA) to ensure that they get thorough knowledge on climate related issues in agro production. In so doing, they would in turn find it easy to instruct farmers on the same. This also acts as a way of simplifying information so that the A. E. D. Os, who directly communicate with farmers may get the right and correct interpretation of information.

- The 87% strong agreement to the ability to understand weather and climatic content sent to farmers with 100% ably stating that they were able to use the information to determine the time to plant crops reveals that information sent is useful and applicable. Thus, it can be concluded that the information sent was user friendly and easy to understand. This was the case due to trainings conducted.

5.2 Recommendations

In the E.P.A., most roads are seasonal hence are almost impassable during the rainy season. Therefore, improving the road network to secondary or gravel roads may assist roving A. E. D. Os to continue rendering their services during such times. Also, network coverage should be improved more especially in areas sharing boundaries with Mozambique to ease the conveyance of information from the agromet. office to the end users. The study has concluded that the agromet. station is uses digital, written as well as verbal categories of communication to communicate climate information to farmers in the E.PA. with the latter being the most prominent. Also, A. E. D. Os and Bembeke FM, the community radio are the trusted and most used channels used by the agromet. office to convey agrometeorological information to farmers within the EPA. However, due to the sampling method used, which was snow ball sampling, and the smaller sample size, the results may have favoured the office due to the fact that those farmers encountered had undergone training on how to use weather and climate information. further studies need to be conducted using other sampling techniques to avoid skewed results as found in this study.

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APPENDIX

DATA COLLECTION QUESTIONNAIRE (OFFICERS)

Title: Agrometeorological information Communication, A Key to Improved Production.

Identifier:

Principal investigator: Nickson Mulilima

Date: location:

x: Y:

Note*: The particulars of the respondents will be written on a separate paper for privacy. Only a digit will be placed on this sheet.*

This questionnaire has been developed by the Principal Investigator with the aim of acquiring data which will help in writing a dissertation for submission in partial fulfilment for the requirements of the award of Bachelor of Science Degree in Meteorology and Climate Sciences. The study aims at assessing the effectiveness of agrometeorological station, mostly in terms of communication of Decision Support services to farmers. The collected data shall remain confidential and shall only be used for the research project.

Instructions:

a). This questionnaire has 3 sections and 3 pages excluding the cover page, please check that all sections are present before you begin responding.

b). Please respond as per the format the question requires.

c). For closed questions, just encircle the solution of your choice. For open ended question, you may choose either to respond orally or write the answer of your choosing in the spaces provided.

d). questions whose response requires ticking may be responded to by ticking against the box that is next or adjacent to the answer of your choice.

SECTION A: COMMUNICATION CHANNEL ASSESSMENT

1. What category of communication channel does your office use when communicating climate information to other stakeholders such as farmers and other offices? (For the Met. Officer, please include how communication with the headquarters as another office in addition to the Extension office).
   a. Verbal b. Written c. Non-verbal d. Digital

2. Would you please specify the choice of communication channel from your choice in 1 by encircling the choices below:

i. Face to face conversation	**ii.** Videoconferencing	**iii.** Telephone
iv. Leaflets	**v.** Email	**vi.** Mobile device
vii. Blogs	**viii.** Letter	**ix.** Spreadsheets
x. Group meetings /workshops	**xi.** Social media (whatsApp, Facebook…)	
xii. Media coverage	**xiii.** Films and animations	**xiv.** Newsletter

xv. Webinars (zoom, Google meet…) **xvi.** Display Materials (Wall marts, Posters)

3. Would you please explain why your office uses the specified channel or media platform(s)?

   _____

   _____

4. What are some of the challenges encountered when using these modes of communication?

   _____

   _____

   _____

5. Are there any suggested ways the current communication channel may be improved to improve their effectiveness?

   _____

6. Does your office have any document explaining its communication channel?

If yes, please attach the document to this questionnaire for analysis.

SECTION B: INFORMATION'S USER-FRIENDLINESS

7. What kind of weather and climatic information do you send to farmers?
   a. Weather Updates b. Decision Support information c. Early Warning

8. In What form is the data or information sent?
   a. Qualitative b. Quantitative c. Both a and b

9. What does it contain also: (Please tick against each box of your answer's choice)
   Graphs ☐ Figures ☐ Charts ☐ Calculations ☐

10. In In what language is the information transmitted?
    English ☐ Chichewa ☐
    Other languages (specify)_____

11. What techniques do you use to simplify the message so that the information reaches the farmers in the intended manner?

    _____

    _____

    _____

12. How do you determine that the information communicated to farmers has been understood and used per your offices' intention?

    _____

    _____

    _____

SECTION C: TIMING OF INFORMATION TRANSMISSION

13. How often do you send agrometeorological communication to farmers and Extension office (For met officer only)

    a). once a day ☐ b). More than twice a day ☐ c). Once a week ☐

    d). more than on once a week ☐ e). Per fortnight ☐ e). Monthly ☐

14. How are Early Warning messages communicated to farmers for a quick response?

    _____

    _____

    _____

15. How long does it take to get feedback from the farmers on the communication made?

    a). Never ☐ b). Once a day ☐ c). More than once a day ☐ d). Once a week ☐

    e). More than once a week ☐ f). Per fortnight ☐ g). Monthly ☐

16. Does your office agree that the timing of information conveyance is effective?

    1. Strongly agree ☐
    2. Agree ☐
    3. Neutral ☐
    4. Disagree ☐
    5. Strongly disagree ☐

17. Would you please suggest ways on how the timing of information conveyance may be improved (if any)

_____

_____

The End.

DATA COLLECTION QUESTIONNAIRE (FARMERS)

Title: Agrometeorological information Communication, A Key to Improved Production.

Identifier:

Principal Investigator: Nickson Mulilima

Date: location:

x: Y:

Note*: The particulars of the respondents will be written on a separate paper for privacy. Only a digit will be placed on this sheet.*

This questionnaire has been developed by the Principal Investigator with the aim of acquiring data which will help in writing a dissertation for submission in partial fulfilment for the requirements of the award of Bachelor of Science Degree in Meteorology and Climate Sciences. The study aims at assessing the effectiveness of agrometeorological station, mostly in terms of communication of Decision Support services to farmers. The collected data shall remain confidential and shall only be used for the research project.

Instructions:

a). This questionnaire has 2 sections and 3 pages excluding the cover page, please check that all sections are present before you begin responding.

b). Please respond as per the format the question requires.

c). For closed questions, just encircle the solution of your choice. For open ended question, you may choose either to respond orally or write the answer of your choosing in the spaces provided.

d). questions whose response requires ticking may be responded to by ticking against the box that is next or adjacent to the answer of your choice.

SECTION 1: GENERAL KNOWLEDGE

1) What is your educational level?

Never attended school ☐ Primary ☐ Secondary ☐ Tertiary ☐

2) Would you please specify your field of expertise?

Livestock farmer ☐ crop husbandry ☐ Both ☐

3) For how long have you been engaged in the occupation?

0 – 5 years ☐ 6 – 10 years ☐ More than 10 years ☐

SECTION 2: COMMUNICATION CHANNEL ASSESSMENT

4) Have you ever received updates on agrometeorological (weather or climate related) information?

Yes ☐ No ☐

5) If yes, would you please list the sources where you got the Information?

(a)_____

(b)_____

(c)_____

(d)_____

(e)_____

(f)_____

(g)_____

(h)_____

6) How often do you receive such updates?

a). once a day ☐ b). More than twice a day ☐ c). Once a week ☐

d). more than on once a week ☐ e). Per fortnight ☐ e). Monthly ☐

7) Are you able to use the information in your production processes?

Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree ☐

8) Do you properly understand the messages that you receive?

Yes ☐ No ☐

9) If yes, go to question 10, if No, would please tell the reasons that make you fail to understand the communication properly?

_____

_____

10) Would you please specify how it is useful in decision making on farm operations?

a. Determine when to spray chemicals b. when to do a deworming exercise

c. When to plant d. when to irrigate

11) Have you ever been affected by any weather and climate-related variability hazard?

Yes ☐ No ☐

12) If yes, please specify by choosing the hazard below:

a. Flash floods b. unexpected heavy rains c. dry spell d. Strong winds

13) Did you receive any update concerning the hazard?

Yes ☐ No ☐

14) If Yes, was the update or communication timely?

Yes ☐ No ☐

15) Would you provide a reason for your choice in 14 above?

_____

_____

_____

16) What did you lose when the hazard hit?

a). Harvested goods b). Livestock c). Crops in the field d). Chemicals

17) In your opinion do you think that there is a need to improve the communication channel?

Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree ☐

18) How often are the Extension Officers available to respond to your queries? (Specify by providing meeting times, either daily, weekly or monthly)

_____

19) Should the timing of communication be improved?

Yes ☐ No ☐

The End!