RESEARCH PROPOSAL TITLE:

Analysis of the contribution of information and communication technologies (ICTS) in climate change awareness in Seke and Murewa districts of Zimbabwe

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ABSTRACT

Climate change presents a major challenge for sustainable development the World over and southern Africa in particular, with adverse impacts expected on the environment; human health; food security; economic activity; and natural resources. Because of rural households' vulnerability to climate change, there is need to devise strategies and coping mechanisms that enhance their capacity to adapt to and participate in mitigation of climate change. The purpose of this study is to examine the importance and contribution of information and communication technologies on rural people's awareness of climate change in Seke and Murewa districts in Mashonaland East province of Zimbabwe. It is premised that information and communication technologies can play an important role as a medium of information and communication in climate change awareness, if people are aware they are better able to adapt to and also to mitigate climate change hence the focus of this study. In collecting the primary data both quantitative and qualitative approaches were used, these include: focus group discussions; key informant and the general household survey.

The findings indicate that the majority of the respondents were aware of climate change. The second finding is that there were significance differences in the level of climate change awareness between those who had access and those who did not have access to ICTs. Those who had access to ICTs had a higher level of climate change awareness than those who did not have. The significance of ICTs in climate change awareness was

evaluated further evaluated using two regression models. Firstly evaluating the significance of ICTs on the likelihood of a respondent being aware of climate change using a binary logistic model, and secondly the evaluation of the significance of ICTs together with other socio-economic factors in influencing the level of climate change awareness, using an ordered logistic model. The preliminary results indicate that access to the following ICTs namely: access to farming/environmental magazines (really old ICT); access to radio (old ICT); access to mobile phone (new ICT) had a significant positive relationship with the likelihood that a respondent was aware of climate change. Further analysis of the data is still being carried out, such as evaluating the influence of access to ICTs on the level of climate change awareness in relation to other factors.

1 BACKGROUND AND JUSTIFICATION

Africa is one of the most vulnerable continents to climate change and climate variability, a situation aggravated by the interaction of 'multiple stresses', occurring at various levels, and low adaptive capacity (Boko, et al., 2007:435). Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity (IPCC, 2007:6). Many areas in Africa are recognized as having climates that are among the most variable in the world on seasonal and decadal time scales (UNFCCC, 2007:18). Cooper et al., (2008:25) noted that whilst the exact nature and extent of the impacts of climate change on temperature and rainfall distribution patterns remain uncertain, it is the poor and vulnerable who will be the most susceptible to changes in climate. In Africa, warming throughout the continent and in all seasons is *very likely* to be larger than the global annual mean warming; rainfall in southern Africa is *likely* to decrease in much of the winter rainfall region and western margins while there is *likely* to be an increase in annual mean rainfall in East Africa (Christensen, et al., 2007:850). Agricultural production on the continent relies mainly on rainfall and is severely compromised in many countries, particularly for subsistence farmers (UNFCCC, 2007:18).

Though farmers have developed several adaptation options to cope with current climate variability, such adaptations may not be sufficient for future changes of climate (Boko, et al., 2007:435). *Adaptation* is the adjustment in natural or human systems in response

to actual or expected climatic stimuli or their effects, which involves changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change (IPCC, 2001:879; Adger, Arnell, & Tompkins, 2005:78; IPCC, 2007:6). Farm Radio International (2009) noted that farmers can prepare for and adapt to the negative effects of climate change only if they understand it and know its impacts. Adapting to climate change involves cascading decisions across a landscape made up of various agents and it involves different actions (Adger, Arnell & Tompkins, 2005:79). Actions associated with building adaptive capacity may include communicating climate change information, building awareness of potential impacts, maintaining well-being, protecting property or land, maintaining economic growth, or exploiting new opportunities (ibid).

The World Resources Institute in collaboration with UNEP and World Bank (2011:16-17) identified five key elements in climate change decision making, these are: public engagement; decision-relevant information; institutional design; tools for planning and policymaking; and resources. From these elements, public engagement and decision-relevant information are more important to climate change awareness. Public understanding of risks and solutions is essential, as this help in defining adaptation needs and lead to better outcomes. Decision-relevant climate Information should include climate data combined with demographic, economic, social and environmental information (ibid). The UNFCCC (2007:14) noted that it is not just climate data that is needed for effective vulnerability and adaptation assessments to climate change, equally as important, and very much lacking at present, is the need for accurate socio-economic data.

This study incorporates socio-economic analysis in exploring the contribution of ICTs to climate change awareness amongst rural households. It is multi-disciplinary study as it integrates different aspects from various disciplines which include: community informatics; communication for development; innovation systems and technology adoption; climate change and agriculture. Stillman & Linger (2009: 255) noted that community informatics (CI) is an emergent discipline with a dual focus: firstly, the conduct of research about the relationship between the design of information and communications technologies (ICTs) and local communities, and secondly, the

implementation of ICT projects in local communities. According to (Acunzo, 2009:6), Communication for development approach is a participatory approach that integrates the use of communication strategies, media and processes to enable people and institutions to share knowledge and information and reach consensus towards common action; its strategies focus on responding to knowledge and information needs of rural audiences, including both rural knowledge institutions and vulnerable groups.

1.1 Key terms

Climate change awareness

The Oxford dictionary (10th edition) defines "awareness" as having knowledge or perception of a situation or fact. The UN/ISDR (2010) defines "public awareness" as the process of informing the general population, increasing levels of consciousness about risks and how people can act to reduce their exposure to hazards. Public awareness activities foster changes in behaviour leading towards a culture of risk reduction (ibid). In this study "climate change awareness" is analysed more from the public awareness point of view, hence the following definition is adopted. Climate change awareness is having knowledge or perception of climate change including knowledge related to its causes, effects, adaptation and mitigation strategies.

Information and Communication Technologies (ICTs)

The term Information and Communication Technologies (ICTs) is used to refer to hardware, software, networks and media for collection, storage, processing, transmission and presentation of information in the formats of voice, data, text and images (World Bank (n.d.); Nyirenda-Jere, 2010). Greenberg (2005:16-17) noted that ICTs are often categorized based on how long they have been in common use, and to some extent the technology used for the transmission and storage of information. Greenberg identified three categories namely: new; old; and really old ICTs.

- *New ICTs* are mainly based on digital technology, these include: computers, satellites, wireless one-on-one communications; mobile phones, the Internet, e-mail and multimedia.

- *Old ICTs* have been in reasonably common use throughout much of the world for many decades, these include: radio, television, land-line telephones and telegraph. They are mainly based on analogue technology though some are now migrating to digital technology.
- *Really Old ICTs* have been in common use for several hundred years, these include: newspapers, books and libraries (ibid).

Though most of the current literature refers to ICTs as those based on the new digital technology; the working definition of ICTs adopted in this study includes all the above categories namely "new; old; and really old ICTs".

2 RESEARCH PROBLEM

Climate change affects agriculture because they are closely related, the type of agriculture and the output thereof is directly dependent on the prevailing climate. Because of the large dependence on primary agriculture, natural weather patterns and basic means of production, the economic performance and livelihoods in rural areas are highly unstable. The United Nations Framework Convention on Climate Change (UNFCCC) identified two responses to climate change: mitigation of climate change by reducing greenhouse-gas emissions and enhancing sinks, and adaptation to the impacts of climate change (Klein, et al., 2007:748). For communities to adjust to climate variability and change, their ability to cope better with the constraints and opportunities must first be enhanced (Cooper *et al.* 2008: 34). In order for rural people to successfully adapt to climate change and mitigate it, they need information and knowledge about the various aspects of climate change.

Grothmann and Patt (2005:205) highlighted that cognition of an individual always depends on his or her socio-physical context, and the social discourse e.g. people's perceptions of risk or adaptive capacity with regard to climate change are influenced and shaped by what they hear about climate change in the media, from friends, colleagues, neighbours, or public agencies. Ngigi (2009:110) noted that farmers' capacity to adapt to climate change can be strengthened by awareness creation, educating farmers with tested and proven methods, and dissemination of climate change

information. The importance of information and knowledge in dealing with the climate change challenge was also highlighted by Acunzo (2009:5) who noted that:

> "Climate change implies new challenges for research and technology development as well as knowledge and information exchange …. Enhancing rural knowledge institutions to adequately generate knowledge and information related to these new challenges, and then share this with the affected people is, therefore, a strategic path for reducing vulnerability to climate change."

Farmers' ability to perceive climate change is a key precondition for their choice to adapt (Gbetibouo, 2008:1). If rural households have access to information, it will enhance their awareness and adaptation capacity, as Brodnig and Mayer-Schonberger (2000 cited by Thioune, 2003:3) noted that accurate and reliable information is a key element for sustainable development. Information can lead to knowledge and that knowledge is a prerequisite for development (Mansell and Wehn 1998; Danofsky 2005; Hamel 2005; Ahmed 2005 as quoted by Ahmed 2007:16). Melville (2010:14) noted that information systems are important in environmental sustainability by enabling new practices and processes in support of belief formation, action formation, and outcome assessment.

Information to farmers comes from several sources including extension services. Extension is defined as a non-formal educational function that involves dissemination of information and advice with the intention of promoting knowledge, attitudes, skills and aspirations (Rivera and Qamar, 2003:7). However in many developing countries the extension system has been reported not to be working properly. Richardson (2003:8 citing World Bank, 1999) noted that evaluation research demonstrates that dominant donor supported training and visit (T&V) extension approach has not proven itself to be a system that meets user demand for appropriate content and appropriate learning methods. This was also concurred by Ngigi (2009: 124) who noted that a gap exists in the provision of extension services; public extension services have been declining due to inadequate financial and human resources, and poor infrastructure.

Information must reach those affected in a form that makes it useful for decision making; dissemination methods must at times be rapid, particularly in the case of

extreme events; and must also reach remote communities (World Resources Institute in collaboration with UNEP and World Bank, 2011:9). Information and Communication Technologies (ICTs) hold a great promise, firstly in the generation of important information, secondly its subsequent transmission, and thirdly by linking people and organisations (Mudombi & Muchie, 2010: 1). Ospina (n.d:1) noted that ICTs are enabling technologies that offer a still untapped potential to strengthen community resilience to climate change. ICTs can play an important role as a medium of information and communication in climate change awareness, adaptation and mitigation strategies. However a number of researchers have called on the need to conduct more research in the field. Gurstein (2001:1) raised an important question as to how can the opportunities being brought by ICTs be realized within the real context of specific conditions and limitations in developing world contexts and specifically for those in rural areas. Thioune (2003) noted that ICTs are known to transform communities; however the details of these transformations, the degree and pace of such changes are yet to be fully grasped.

Ospina & Heeks (2010:3) noted that experiences from vulnerable communities in Asia, Africa, Latin America and the Caribbean point to the use of ICT applications as part of climate change responses, however, this constitutes a very new field of enquiry where much remains to be explored. The World Bank (2011:6) also highlighted the need for more research on ICTs, it asserted that:

> "The excitement generated by ICTs as they spread throughout developing countries has often masked the fact that their contributions to agriculture are both rapidly evolving and poorly understood. It is too early to have a clear idea, supported by rigorous analysis, of how ICTs support agricultural development, and under what conditions."

This study seeks to contribute some answers to some of the concerns that have been raised. It seeks to explore how information and communication technologies as sources of information and also as communication means contribute to climate change awareness amongst rural people.

2.1 OBJECTIVES

The main objective of the study was to analyse the role/contribution of Information and Communication Technologies (ICTs) in climate change awareness in rural communities. The main objective was supported by the following sub-objectives:

- Analyze the level of climate change awareness amongst rural people in Seke and Murewa districts of Zimbabwe.
- Assess if there is a positive difference in the level of climate change awareness between those who had access and who did not have access to information and communication technologies (ICTs).
- Establish if there is a positive relationship between access to information and communication technologies (ICTs) and climate change awareness.
- Assess the factors that influence the adoption of various ICTs.
- Explore the role of ICTs in the agricultural innovation system in rural communities.

3 THE THEORETICAL FRAMEWORK

This study intergrates a variety of theoratical and conceptual frameworks. The broad framework adopted is the innovation system persepective. Baskaran and Muchie (2010) noted that the use of the concept of systems of innovation has grown and proliferated over the years, and this can be traced in four major areas: (i) spatial; (ii) industry and technology specific; (iii) in terms of innovation types; (iv) in terms of level of technology/ innovation complexity; and (v) in terms of economic and social objectives.

In the broad innovation systems perspective, this study specifically focuses on a specific sector, the agricultural sector hence the agricultural innovation system perspective. The concept of sectoral innovation system attempts to provide a multidimensional, integrated and dynamic view of sectors; it encompasses and includes the technological system approach, by placing it within the sectoral context (Malerba, 2002: 2-3; Baskaran & Muchie, 2010). It is composed of three main building blocks: knowledge and information flow; actors and networks, institutions; linkages between these entities (ibid). Malerba (2002: 6) also noted that evolutionary theory provides a broad

theoretical framework to the concept of sectoral system of innovation and production; evolutionary theory places a key emphasis on dynamics, process and transformation; learning and knowledge are key elements in the change of the economic system "Boundedly rational" agents act, learn and search in uncertain and changing environments.

Anandajayasekeram, Puskur, and Zerfu (2009: 80) noted that the first factor contributing to the adoption of the concept of innovation systems in the agricultural sector is the successful application of the concept in the industrial sector e.g. by Christopher Freemen, Benget – Aka Lundvall etc. AIS perspective provides a means of analysing how knowledge is exchanged and how institutional and technological change occurs in a given society by examining the roles and interactions of diverse agents involved in the research, development and delivery of innovations that are directly or indirectly relevant to agricultural production and consumption (Anandajayasekeram, Puskur, & Zerfu, 2009: 88). The agricultural innovation system has the agricultural knowledge and information system (AKIS) as one of its component. Agricultural Knowledge and Information System (AKIS) combines agricultural research, extension, and education in one system (also known as the knowledge triangle) and focuses on how the three activities generate new knowledge and information for farmers (Anandajayasekeram, Puskur, & Zerfu, 2009: 35).

Also important to this study is the diffusion of innovations theory as proposed by Rogers. Diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system, it is a special type of communication, in that the messages are concerned with new ideas (Rogers, 1995:5). In this study, the communication is not about an innovation, but about a relatively new concept namely climate change. Rogers (1995:6) further noted that the newness of the idea means some degree of uncertainty is involved in diffusion; uncertainty is the degree to which a number of alternatives are perceived with respect to the occurrence of an event and the relative probability of these alternatives. Diffusion is a kind of social change, defined as the process by which alteration occurs in the structure and function of a social system; when new ideas are invented, diffused, and are adopted or rejected, leading to certain consequences, social change occurs (ibid). Though the diffusion of

climate change information and knowledge is not a sufficient condition for people to adopt climate change adaptation and mitigation strategies, it is a necessary condition. The main focus of this study is climate change awareness hence the diffusion of climate change information and knowledge and how information and communication technologies (ICTs) contribute to the diffusion of this information and knowledge.

4 RESEARCH METHODS

The study used the mixed/multi-methods approach which involves a combination of quantitative and qualitative methodologies. The multi-method approach is more advantageous as each approach brings special strengths, and each compensates for the weaknesses of the other (Baxter and Babbie, 2004:65). Rudestam and Newton (2001:45) noted that this approach combines the rigor and precision of quantitative methods with deep understanding provided by qualitative methods. The study used the general household survey, focus group discussions and key informant interviews. *Focus group discussions* were be conducted to elicit information on men and women's perceptions of climate variability, the impacts on their livelihoods, and their coping strategies, access to and perceptions of ICTs and information. *Key informant interviews* were also used to map the institutional context in which farmers make their decisions and to cross-reference information provided by farmers. *Survey of individual farmers* was conducted using a household survey.

4.1 POPULATION

The study was carried out in Mashonaland East province of Zimbabwe. According to the 2002 Census, Zimbabwe has a total population of about 11 634 663 people, and Mashonaland East province has a total population of about 1 127 413 people. Most of the population in the province is rural while the urban population accounts for about 24 percent. The total number of households (both farming and non-farming) in the province is 309 198 (CSO, 2004:3-17). It has 11 districts and from the 11 districts, 2 districts were selected purposively; these are Seke and Murewa districts. The choice of the two districts is because Seke district is close to the capital city Harare and Chitungwiza town, while Murewa district is a bit far away from the major urban areas.

The choice of the two districts is important in evaluating the effect of proximity to urban areas in terms of access to ICTs and climate change awareness. The sampling unit was the household head. At village level the household sampling frame was be sourced from the village head and agricultural extension officers.

4.2 SAMPLING METHOD

A multi-stage random sampling was used in the study. The choice of a multi-stage approach was because it was the most appropriate technique to use in the study given that there were no sampling frames at district level, hence the need to employ different sampling methods at different stages up to the village level where sampling frames were available. Random sampling was used to select the villages and the sampling units (households).

4.3 VALIDITY AND RELIABILITY

As Black (1999:199) suggested, various steps were undertaken to ensure validity and reliability, these are: *validating the instrument* (other experts in the field were consulted to evaluate consistency of the instrument with the desired outcome); *piloting the instrument* with a small representative group of the population and then calculating the Cronbach's alpha to test for reliability; *training of research assistants*; and *data cleansing* (checking entered data for errors). The statistical package for data entry and preliminary analysis was SPSS. The data was also being incorporated into STATA package for higher-order econometric analysis.

4.4 Measurement of variables

The study focuses on two main issues namely: access to and use of Information and Communication Technologies (ICTs) and climate change awareness. The definition of these terms has been given on section 1.1. This study analyses both old and new ICTs namely: radio; television; video cassette recorder (VCR); digital video disc (DVD) player; fixed telephone; mobile phone; satellite decoder; computer; internet; and the really old ICTs which include the traditional print media (newspapers; farming/environmental magazines; business magazines; entertainment magazines;

church magazines; and posters). Though the term ICTs is generally used to refer to information and communication technologies that are electronically based, in this particular study because of its focus on rural areas it was deemed necessary to include even those in print format. Various questions were be formulated to explore different aspects of access to and use of the ICTs.

Climate change awareness was also evaluated. In measuring climate change awareness, the aim of the study was not to solicit a scientific definition of climate change from respondents; the aim was to evaluate people's knowledge on various aspects of climate change which include its causes, effects, adaptation and mitigation. This was done by asking the respondents a yes/no question on climate change awareness; which was the initial question to separate those who were aware and those who were not aware of climate change. Questions or statements with five point Likert scale (*strongly agree; agree; undecided; disagree; strongly disagree)* in which the respondent was expected to indicate his/her level of agreement with the statements were formulated.

4.5 MODEL SPECIFICATION AND DATA ANALYSIS

4.5.1 Testing for differences in access to ICTs and climate change awareness using T-tests

T-tests will be used to test for the differences on climate change awareness between those who have access and those who do not have access to ICTs. The independent t-test was used in this study since it tests differences between different people (those who have access and those who do not have access to ICTs).

4.5.2 Testing for the significant factors influencing the likelihood of being aware of climate change using the binary logistic regression model

The logistic regression model has been used in many applications due to its mathematical convenience (Greene, 2003); in this paper it will be used to test the significance of access to various ICTs on the likelihood of being aware of climate change. The dependent variable is the probability of a respondent being aware of climate change. This dependent variable takes two discrete values, which is 1 if the

respondent is aware of climate change or 0 if the respondent is not aware of climate change.

4.5.3 Testing for the significance of ICTs on the level of climate change awareness using an ordered logistic regression model

Cameroon and Trivedi (2005: 490-528) provide a good account of various multinomial models and a distinction is made between models where regressors vary across alternatives for a given individual and models where regressors are constant across alternatives. Multinomial models are classified into models for unordered outcomes and models for ordered outcomes. Ordered multinomial (probit and logit) models were also used in the study. The rationale for using the ordered multinomial models is because the dependent variables for the respective hypothesis are the level of climate change awareness (an index was created that classified respondents according to their level of awareness). This variable cannot just be treated as ordinary binary outcome (yes/ no) because the respondents are not on the same level of awareness hence the need for ordering.

5 PRELIMINARY RESULTS

5.1 GENERAL DESCRIPTIVES

Generally the majority of respondents knew the various ICTs under study. Most respondents knew the radio (98%); followed by the mobile phone (95%); television (89.6%); fixed telephone (70.9%); computer and satellite decoder (62.9%); DVD (62.7%); VCR (62.2%) and the least known was the internet (48.5%). In terms of access to ICTs, the greatest percentage of households had access to the mobile phone (77.7%); followed by the radio (74.8%); television (46.2%); DVD (14.7%); VCR (11.4%); satellite decoder (10.7%); computer (3.3%); and the least accessed was the internet (2.0%) and telephone (2.0%). The greatest number of respondents indicated that they read the newspaper (72.4%); followed by church magazines (55.2%); farming/environmental magazines (51.5%); posters (50.2%); entertainment magazines (41.5%) and the least read were business magazines (40.5%).

The majority of the respondents indicated that they were aware of climate change, with about 86.3% indicating that they were aware while 13.7% were not. A greater proportion of respondents who were aware of climate change were from Murewa district (94%) while Seke had 78.5%. The level of climate change awareness was further evaluated using the climate change awareness index which evaluated awareness in terms of the respondent's knowledge about various aspects of climate change (effects; causes; adaptation; and mitigation), the index ranged between -1 to 1; an index value close to 1 meant an individual was more aware of climate change while an index value of 0 or below indicates the respondent was not aware of climate change. The average index in the two districts was 0.54. Murewa district had a higher climate change awareness index of 0.59 compared to Seke district's index of 0.48.

Significant differences were observed in the level of climate change awareness between those who had access and those who did not have access to various ICTs; those who had access to ICTs had a higher level of climate change awareness than those who did not have access. Significant differences in the level of climate change awareness were also observed between those who read and those who did not read the various forms of print media; those who read had a higher level of climate change awareness than those who did not.

Respondents were asked whether they considered the ICTs to be important in climate change awareness. The following ICTs namely: radio; television; newspapers; farming/environmental magazines; and business magazines had a greater proportion of respondents who perceived them to be important in climate change awareness. The radio was perceived as the most important (83%); followed by newspapers (59%); television (57%); farming/environmental magazines (43%); and business magazines (24%).

5.2 ICTs influencing the likelihood of a respondent being aware of climate change

The relationship between access to ICTs and climate change awareness was evaluated using a binary logistic regression model. The dependent variable was a binary variable (*1=yes, 0=no*) to the question (*Are you aware of climate change?*) and the independent

variables were access to various ICTs (radio; television; satellite decoder; video cassette recorder; digital video disc player; mobile phone; computer; internet); and the frequency of: reading newspapers; reading farming/ environmental magazines; reading business magazines; reading entertainment magazines; reading church magazines; and reading posters. The logistic regression results are presented in Table 1 below.

Table 1: Binary Logistic regression results

Variable	Odds Ratio	Significance level
Radio access	3.4226	0.003***
Television access	0.2915	0.009***
Satellite decoder access	0.7651	0.776
Video Cassette Recorder access	11.4425	0.185
Digital Video Disc player access	1.8946	0.480
Mobile phone access	1.8269	0.011**
Computer access	0.1440	0.140
Frequency of reading Newspapers	0.8841	0.456
Frequency of reading Farming/ Environmental magazines	1.6723	0.022**
Frequency of reading Business magazines	0.8754	0.657
Frequency of reading Entertainment magazines	1.0247	0.930
Frequency of reading Church magazines	1.0242	0.867
Frequency of reading Posters	0.7907	0.108

Source: Survey data Significance level: * is 10%; ** is 5%; *** is 1%

Four variables were found to have a significant influence on the likelihood that a respondent indicated that he or she is aware of climate change and these were access to: radio; television; and mobile phone; and reading of farming/environmental magazines. The most significant variables were: access to radio and television ownership, which were significant at 1% significance level. Access to mobile phone and frequency of reading farming/environmental magazines were significant at 5% level. The odd ratios of access to: radio; mobile phone; and frequency of reading farming/environmental magazines are greater than 1, which means access to radio and mobile phone; and reading farming/environmental magazines increased the odds of an individual indicating that he or she is aware of climate change. The odds ratio of television ownership is less

than 1, which means access to television reduced the odds of an individual indicating that he or she was aware of climate change.

5.3 Evaluating the significance of ICTs and other socio-economic factors in influencing climate change awareness

ICTs are not the only important factors that can influence climate change awareness hence the need to consider other socio-economic factors. An ordered (multinomial) logit model is used to evaluate which factors influence the level of climate change awareness. The dependent variable is ordered variable whereby respondents were categorised into three ordered groups (0= not aware; 1= average awareness; 2= high awareness). This ordered dependent variable will be regressed against various socio-economic factors.

6 CONCLUSION

The first finding is that the majority of respondents were aware of climate change. The second finding is that there were significance differences in the level of climate change awareness between those who had access and those who did not have access to various ICTs. Those who had access to ICTs had a higher level of climate change awareness than those who did not have. The significance of ICTs in climate change awareness is being evaluated using regression models. A binary logistic model was used to evaluate the significance of ICTs on the likelihood of a respondent being aware of climate change using a binary logistic model. The preliminary results indicate that access to the following ICTs namely: access to farming/environmental magazines (really old ICT); access to radio (old ICT); access to mobile phone (new ICT) had a significant positive relationship with the likelihood that a respondent was aware of climate change. Further analysis of the data is still being carried out, such as evaluating the influence of access to ICTs on the level of climate change awareness in relation to other factors.

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