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## ACCESS TO AND USE OF CLIMATE CHANGE INFORMATION COVERED IN TANZANIAN NEWSPAPERS: A CASE OF SELECTED PERI-URBAN NEWSPAPER READERS IN TANZANIA

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### ABSTRACT

*Access to and use of climate change information is essential for raising people's awareness about adaptation, coping and mitigation strategies in the face of changing climatic condition. This paper assessed the use of newspapers in accessing climate change information by selected peri-urban newspaper readers in Tanzania. Cross-sectional research design was employed with a total of 153 respondents. Data were collected using questionnaire and key informant interviews and were analysed using IBM SPSS Statistics software and content analysis. About two-thirds (65%) of the respondents reported that newspapers were important communication sources in accessing climate change information. However, peri-urban newspaper readers experienced challenges such as inadequate coverage of climate change information (87%), unreliable climate change information (84%), low prominence attached to climate change information (82%), cost barriers (78%), lack of community information centres and public libraries (73%). These impede full access to newspapers for climate change and other developmental information. It is concluded that peri-urban newspaper readers prefer newspapers written in Kiswahili and those with high news coverage. It is recommended that climate change information generators such as TMA should repackage and disseminate reliable forecast information that addresses the needs of the general public through popular and newspapers with national status. It is also recommended that national and local government authorities should provide support to public libraries and to establish community information resource centres in peri-urban areas for enabling newspaper readers to access developmental information including climate change information.*

**Key words:** climate change information, newspapers, newspaper readers, peri-urban, Tanzania

**Paper type:** Research paper

**Type of Review:** Peer Review

### 1. INTRODUCTION

Access to and use of climate change information is essential for raising people's awareness about adaptation, coping and mitigation strategies in the face of changing climatic condition. According to Srinivasan *et al.* (2011) and Jiri *et al.* (2016), access to climate change information is an important pre-condition for adapting, coping, and mitigating the negative impacts of climate change and for informed decision making. Similarly, Noble *et al.* (2014) argued that successful implementation of adaptation, coping and mitigation measures depends upon the

availability and accessibility of information. This implies that people can successfully adapt and cope to climate change and especially on its mitigation if they have access to information and knowledge about the various aspects of climate change. Such aspects include information on its causes, effects, and on ways of responding to it such as early warning signals, seasonal forecasts, food aid distributions, emergency guidelines, and financial supports. It also encompasses other aspects such as biodiversity conservation, water management, food security, sensitisation of communities, donors, governments and all other information related to climate change adaptation, coping and mitigation mechanisms (IPCC, 2007; Mudombi *et al.*, 2014). According to CRED (2009), it is indispensable for the people to know that there are solutions to the problems of climate change and that they can be part of those solutions for improving their livelihood. People can effectively access climate change information for adaptation, coping and mitigation strategies if that information is disseminated through channels which are accessible and user-friendly (Cherotich *et al.*, 2012).

Essential climate change information for planning and decision making is often generated by researchers, agencies, ministries, research institutions and universities. Such information should be disseminated to and accessed by all targeted individuals so that these individuals can benefit from this information. Dissemination of climate change information can be made by different channels such as newspapers, radio, television, journals, books, pamphlets, brochures, posters and the internet. For effective information dissemination to the general public, selection of appropriate dissemination channels through which information flows ought to be made. Such channels will influence access and use of climate change information to enable people and communities to build adequate adaptive capabilities. In other words, each dissemination channel has its own advantages and disadvantages. According to Schmidt *et al.* (2013) and Chand (2017), newspapers play a central role in raising awareness, informing, educating and influencing behavioural change in people and communities they serve. Pacoma (2019) adds that newspapers play the most important role in addressing the problem of climate change especially when they cover and represent climate change information as a way of creating public awareness among news consumers. Newspapers have additional advantages when compared to other communication channels such as radio and television. Such advantages include, being permanent and references can be made for future use after many years and also a reader can review and study the materials at his/her own pace and convenient time (Dolsak and Houston, 2014).

Although newspapers are important vehicles of information dissemination in Tanzania, there are distresses that people do not yet effectively use them to access developmental information including climate change information (Lunyelele *et al.*, 2016). Lack of access to information on climate change may in turn lead to low awareness about potential impacts of climate change and thus leading to low adaptive capacity (Williamson *et al.*, 2010; Amdu *et al.*, 2013; Giordano, 2014). Besides, challenges which impede peri-urban newspaper readers to access newspapers for climate change information are not also well known and documented. This study assessed the use of newspapers in accessing climate change information by peri-urban newspaper readers in Coast, Dar es Salaam and Morogoro regions in Tanzania. The study which resulted into this paper was conducted among peri-urban newspaper readers because they have access to newspapers which are mostly disseminated in the urban centres. They also require climate change information for their agriculture and related activities. Agriculture in these areas is more vulnerable to climate change because it is mainly rain-fed dependant. In peri-urban areas there are people who perform agriculture as their primary or secondary activity. Thus, the assessment of the use of newspapers in accessing climate change information by peri-urban newspaper readers in Tanzania is necessary for raising their awareness about the available options in climate change adaptation, coping and mitigation strategies. This paper is a part of a wider study which focused on the role played by newspapers in the dissemination of climate change information in Tanzania. Specifically, this paper presents the extent at which peri-urban newspaper readers used newspapers to access climate change information, the types and use of climate change information accessed through newspapers by peri-urban newspaper readers, newspaper reader's perception on the usefulness of climate change information covered in

Tanzanian newspapers and examined the challenges facing peri-urban newspaper readers when accessing newspapers for climate change information in Tanzania.

### 1.1 Conceptual framework

The conceptual framework used in this paper was adapted with a modification from (Cherotich *et al.*, 2012) based on the theoretical and empirical review of literature. Fig.1 presents the conceptual framework adapted in this study. The framework shows the hypothesised flow of climate change information from the newspapers to the newspaper readers. In this study it is assumed that newspaper readers can effectively access information on climate change from the newspapers for awareness creation if the impediments to access such information are alleviated.

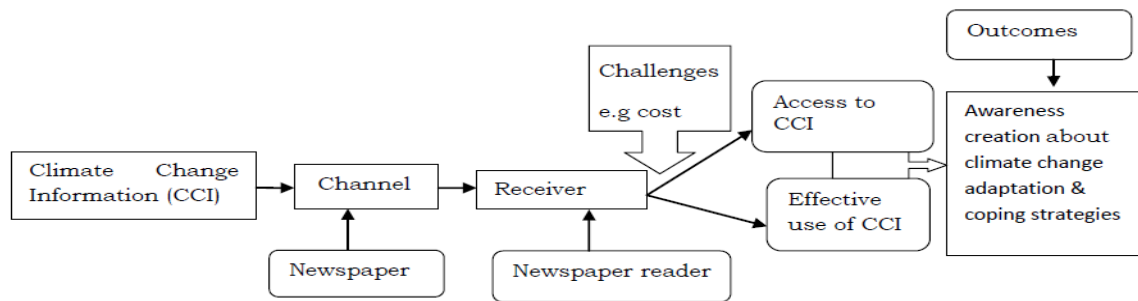


Figure 1: Conceptual framework modified from Cherotich *et al.*, 2012

## 2. METHODOLOGY

This paper is based on a study conducted in peri-urban areas of Coast, Dar es Salaam and Morogoro regions. All these three regions are located on the Eastern side of Tanzania Mainland. The peri-urban areas in these three regions were selected because they have access to newspapers from the nearby city of Dar es Salaam where most newspapers media houses are located. The peri-urban areas in these regions also have relatively good road infrastructure which facilitates easy and timely newspapers penetrations which in turn leads to higher newspaper's circulation and readership by peri-urban communities (AMB, 2015). In the context of this study, peri-urban areas are the ones which are located in the urban peripheries and that serve as interface between the urban and the rural; and where urban and rural features and processes meet, intertwine and interact (Ricci, 2012).

The study adopted a cross-sectional research design using both qualitative and quantitative research approaches. The key assumption for combining qualitative and quantitative approaches is that it provides a more comprehensive understanding of a research problem than when either of the approaches is used alone (Creswell, 2014). Qualitative and quantitative approaches were therefore combined to enable the analysis and output to complement each other so as to reach the desired conclusions. According to Sedgwick (2014), cross-sectional research design enables data to be collected at a single point in time to capture important aspects and allows for questionnaire survey. The design is also considered appropriate for descriptive analysis and for generalisation of findings. Purposive sampling technique was used to select three regions comprising of six districts. Two districts were selected from each region. Purposively selected districts were Morogoro Urban and Mvomero from Morogoro region, Ubungu and Temeke from Dar es Salaam region, Kibaha and Bagamoyo from Coast region. These districts were selected on the basis of having more peri-urban newspapers selling centres as compared with other districts in the selected regions. From each district, two wards which have urban and rural mixed characteristics were selected making a total of 12 wards from all three regions. The selected wards are Bwilinga and Dunda (Bagamoyo), Mlandizi and Kilangalanga (Kibaha), Buza and Chamazi (Temeke), Kibamba and Kwembe (Ubungo). Others are Kingolwira and Kihonda (Morogoro Urban), and Mzumbe and Melela (Mvomero). Purposive sampling technique was also used to select two key informants (KIs) from each district making a total of 12 community members who comprised of famous readers and long term buyers of

newspapers in the area. To obtain KIs, researcher made a visit to the newspapers selling centres in each ward. With an assistance of newspapers vendors, one famous newspapers reader was identified from each ward. Purposive sampling technique was also used to select six registered Tanzanian newspapers based on the criteria such as national wide coverage and diversity of news, accessibility, and consistency in publishing their editions with diversity of news coverage, ownership type, language orientation, and frequency of publication. Newspapers that focus on religious, political, and sensational news; lack of national wide coverage, lack of diversity of news coverage as well as those which were published in languages other than Kiswahili or English were excluded. Purposive sampling technique was used to select cases that answered the research questions in order to meet the objectives of the research. According to Newman (2000), purposive sampling technique is often used when a researcher wishes to select cases that are particularly informative.

Snowball or chain-referral sampling technique was used to identify the respondents for this study. The technique was used because the sampling frame of peri-urban newspaper readers does not exist leading to unknown size and boundaries of such population. According to Saunders *et al.* (2007) and Dragan and Isaic-Maniu (2013), snowball sampling technique is used when it is difficult to identify members of desired population. This technique required the researcher to have a contact with newspaper vendors who in turn helped to identify up to three newspaper readers. The identified cases helped the researcher to further identify other cases until the desired sample of 153 readers was researched.

Quantitative data resulting from survey research were collected using questionnaire whereas qualitative data were obtained using key informant interviews (KIIs). A total of seven KIIs were administered. Data for this study were collected from April to December 2017. Quantitative data were analysed using IBM Statistical Package for Social Sciences (SPSS) Statistics software Version 20 based on descriptive statistics including frequencies, means and percentages. Qualitative data were analysed using content analysis by carefully studying and interpreting data gathered by tape recorder; transcribed for analysis and by note-taking in order to establish meaningful qualitative information.

### **3. FINDINGS AND DISCUSSIONS**

#### **3.1 Demographic information**

Demographic characteristics of the respondents in this study include sex, education, occupation and age. Such characteristics are important as they influence the choice of sources of information used by peri-urban community members to get information about climate change. Of the 153 respondents, majority (87%) were males whereas only (13%) were females. This low proportion of women is attributed to the fact that in most cases women are overwhelmed by the domestic chores and thus they lack time to read newspapers as compared to their male counterparts. Slightly more than a quarter (28.8%) of respondents had a bachelor degrees and above level of education followed by those with ordinary and advanced level secondary school education (28.1%) and those with primary school education qualification (26.8%). Majority (73.3%) of respondents had education above primary school level which implies high literacy level in the study area. Furthermore, 41.8% of respondents comprised of business persons followed by farmers (17%), extension officers (15%) and other civil servants (15%). The mean age of respondents was 42 years old (Table 1).

The findings in Table 2 show the distribution of respondents in the selected peri-urban areas. The results show that Dar es Salaam region had 71 (46.4%) respondents followed by Morogoro (44; 28.75%) and Coast region (38; 24.75%). There are more peri-urban newspaper readers in Dar es Salaam and Morogoro perhaps because there are more newspaper sales centres and the presence of libraries services where peri-urban newspaper readers can access newspapers.

**Table 1: Demographic characteristics of peri-urban newspaper readers (n=153)**

Category	Frequency	Percent (%)
<b>Sex</b>		
Males	133	87.0
Females	20	13.0
<b>Education</b>		
Primary education	41	26.8
Ordinary and advanced level secondary education	43	28.1
Certificate	1	0.7
Diploma	24	15.7
Bachelor degree and above	44	28.8
<b>Occupation</b>		
Farmers	26	17.0
Business Persons	64	41.8
Students	2	1.3
Pastoralists	5	3.3
Researchers	6	4.0
Extension Officers	23	15.0
Forestry Officers	2	1.3
Other civil servants	23	15.0

**Table 2: Distribution of respondents**

		N = 153					
Region	District	Males		Females		Total	
		Freq.	%	Freq.	%	Freq.	%
Coast Region	Bagamoyo	17	11.11	2	1.30	19	12.41
	Kibaha	16	10.46	3	2.00	19	12.41
Dar es Salaam	Temeke	26	17.00	5	3.27	31	20.26
	Ubungo	34	22.22	6	4.00	40	26.14
Morogoro	Morogoro Urban	24	16.00	3	2.00	27	17.64
	Mvomero	16	10.46	1	0.65	17	11.11
Total		133	87.00	20	13.00	153	100

### 3.2 Awareness about climate change

Respondents were asked to indicate the level of awareness so as to ascertain the extent at which they understand the concept about climate change. More than one-third (36%) of respondents indicated that they were aware and nearly two thirds (62%) were moderately aware. Though in different degree of awareness, generally these findings show that majority of participants were aware about climate change. Awareness about climate change by the majority of respondents is perhaps associated with high literacy level which in turn enables them to read various sources of information including newspapers. Similarly, Lunyelele *et al.* (2016) reported that more peri-urban communities in Dar es Salaam are aware about climate change. Despite the fact that awareness about the climate change does not promise action to adapt, cope and mitigate, these findings suggest that, perhaps those community members who are aware about climate change will consider to engage on adaptation, coping and mitigation strategies on the potential impacts of climate change for enabling them to plan for their activities accordingly.

### 3.3 Channels used by peri-urban newspaper readers to access climate change information

The paper sought to establish the extent at which peri-urban newspaper readers use various channels to access climate change information. The findings in Table 3 indicate that 65% of respondents show that they highly used newspapers to access climate change information. Nearly one fifth (21%) of the respondents used the newspapers moderately. These findings signify that newspapers are among important channels for accessing climate change information among peri-urban newspaper readers. The findings are in conformity to that of Kabir *et al.* (2016) who reported that newspapers are important sources of information about climate change. According to Shrestha (2002), Falaki and Adegbija (2013), Schmidt *et al.* (2013), Chand (2017) and Harris (2017), readers can use newspapers for raising their awareness and influencing behavioural change about climate change. This is perhaps attributed to the fact that, when compared to other mass media channels such as radio and television, the information covered in the newspapers can be easily stored for much longer time for reading and future use, shared by readers, they provide flexibility in reading them as they can allow readers to review and study the materials at their own appropriate places, suitable and relevant time and they can also provide prominent coverage to a particular subject (Boykoff and Boykoff, 2007; Salathong, 2007; Aiyesimoju and Awoniyi, 2010; Nelson, 2011;URT, 2012; Dolsak and Houston, 2014). Apart from newspapers, peri-urban newspaper readers were asked to list other communication channels they use for accessing information on climate change. The respondents listed channels such as television (56%), radio (53%), community outreach (40%), extension workers (35%) and researchers (27%).

**Table 3: Channels used by peri-urban newspaper readers for accessing climate change information**

Communication channel	n	Highly used		Moderately used		Least used		Not used	
		No.	%	No.	%	No.	%	No.	%
Newspapers	151	98	65	32	21	18	12	3	2
<b>Other channels</b>									
Radio news	147	78	53	30	20	19	13	20	13.6
Television news	145	82	56	30	21	26	18	7	4.8
Community outreach	144	57	40	43	30	23	16	21	14.7
Researchers	143	39	27	29	20.3	19	14	37	26
Extension workers	141	49	35	34	24	32	22.4	26	18

Respondents were asked to indicate the most preferred newspapers for accessing climate change information. The findings indicate that Mwananchi is the most used newspaper followed by Habari Leo and Daily Newspaper (Table 4). When asked to give the reasons for their higher usage of Mwananchi newspaper, nearly three quarters (71%) of the respondents said that Mwananchi covers various type of information including climate change without biases, 65.3% said that it covers a mixture of news from all parts of the country and 62.8% said that the newspaper is published in Kiswahili. Kiswahili is a language which is spoken and understood by the majority of the Tanzanians. Furthermore, 55.4% of respondents said that they prefer reading Mwananchi newspaper to other newspapers because of its higher circulation level. This suggests that owing to her level of coverage, circulation and the language of publication, Mwananchi newspaper may be highly used to access information on climate change for awareness creation among its audiences.

Habari Leo is another frequently used newspaper. The newspaper preference by the peri-urban newspaper readers may be associated with the fact that it is a government-owned newspaper which is trusted for covering policies and guidelines related to numerous types of information including climate change information provided by the government (Elia,2018) and it is also published in Kiswahili. Furthermore, Siyao and Sife (2018) and Ogessa and Sife (2018) reported that government-owned newspapers in Tanzania are somehow service-oriented that they are expected to take a lead as disseminators of developmental information such as climate change. This suggests that Habari Leo newspaper attracts many readers including government officials such as extension officers, researchers, agricultural officers, forestry officers and other civil servants who may get it from their offices for accessing information that meets their needs.

**Table 4: Mostly used newspapers for climate change information**

Newspaper	Frequency of use							
	Daily		Thrice per week		Twice per week		Once per week	
	No	%	No	%	No	%	No	%
Daily News	17	14	14	11	15	12	13	10
Habari Leo	34	25	29	23	13	10	9	7
Guardian	13	10	11	9	17	14	13	10
Mwananchi	95	75	11	9	6	5	6	5
Rai	5	4	20	16	8	6	13	10
This Day	2	2	4	3	9	7	20	16

### **3.4 Types and use of climate change information accessed through newspapers**

Table 5 indicates the types of information associated to climate change accessed by peri-urban newspaper readers. Such types of information include rainfall information (67%), drought-tolerant crops (57%), occurrence of climate change (57%), how to reduce vulnerability (56%), crops planting (53%), rain-water harvesting techniques (49%), seed varieties (48%), information on land use (47%) and crops diseases (44%). Other types of information reported include the general information on climate change (43%), effects of climate change (41%), available response to climate change (28%) and the process of climate change (12%).

With regard to the use of the above mentioned types of information, the peri-urban newspaper readers required information about rainfall for planning and carrying out farming activities. This is necessary because of high dependency on rain-fed agriculture which may be performed as a primary or secondary activity by peri-urban newspaper readers. Knowing when the rain will start for example can determine when crops are planted and harvested. Information on the amount of rainfall in a season is also essential for guiding decisions to grow drought-tolerant crops like sorghum, cassava and millet which are suitable for areas with a little amount of rainfalls. This finding is similar to that of Lunyelele (2018) who reported that cultivation of crop-tolerant crops is essential for increasing resilience of farmers against the impacts of droughts.

Information about the causes of climate change helps readers to plan ahead and make decisions on how to deal with the negative impacts of climate change and how to reduce vulnerability. Vulnerability can be reduced by conducting vulnerability assessments. Such assessments will become effective if there is an access to credible scientific climate change information by newspaper audiences and all the people because a collective effort by all the stakeholders of climate change is required. Such information will create public awareness about the potential effects of climate change for enabling people to take precautionary measures. Information on the crops planting is needed by newspaper readers as it can be used for guiding decision making whether or not to buy early-maturing crops and seeds, and what is the appropriate moment to plant them. Information on the rain-water harvesting techniques is important for helping people to reduce the problem of water resource scarcity.

Furthermore, the need to get information about land use is helpful for understanding the appropriate and sustainable ways of using their land; that means good land use practices.

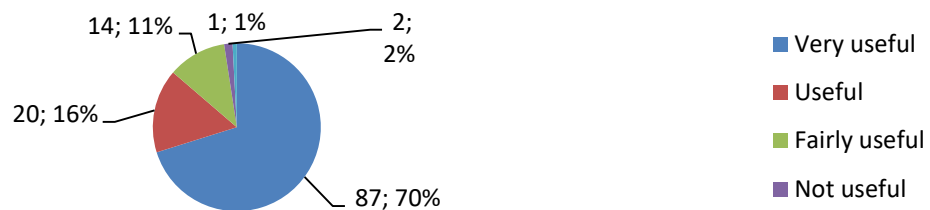
The findings also show that respondents indicated that they obtained information about the available responses to climate change from the newspapers. Such information will motivate people to participate on climate change adaptation, coping and mitigation mechanisms. This demonstrates that the goal of accessing climate change information from the media such as newspapers is to create awareness about causes and effects of climate change, enhance adaptation capabilities and hence to improve peoples' livelihoods. These findings imply that peri-urban newspaper readers need the aforementioned types of information as one of the measures to cope and adapt to the potential impacts of climate change in their areas of localities. Similarly, Tizale (2007) reported that people with information on climate change coping and the adaptation mechanisms at their disposal are able to make use of this information to change their practices in response to changing climatic conditions for improving their livelihoods.

**Table 5: Types of information on climate change accessed by peri-urban newspaper readers**

Types of information	Frequency	Percent (%)
Rainfall	102	67
Drought -tolerant crops	87	57
Occurrence of climate change	87	57
How to reduce vulnerability	86	56
Timely planting of crops	81	53
Rain-water harvesting techniques	75	49
Seed varieties	73	48
Land use	72	47
Crops diseases	67	44
General information about climate change	66	43
Severe effects of climate change	62	41
Available response to climate change	43	28
Process of climate change	19	12

### 3.5 Perceived usefulness of information on climate change covered in Tanzania newspapers

Respondents were asked to indicate as to what extent climate change information they read from the newspapers was useful to them. The findings in Fig. 2 indicate that nearly three quarters (70%) of the respondents found the information to be very useful.



**Figure 2: Perceived usefulness of climate change information covered in the newspapers**

Climate change information obtained from the newspapers was perceived useful to the peri-urban newspaper readers in different ways as indicated in Table 6. Findings indicate that the information obtained from the newspapers was useful for increasing awareness (83%). Awareness on adaptation, coping and mitigation strategies to the impacts of climate change is a forward step towards addressing the impacts of climate change. Ekpoh and Ekpoh (2011) and Adebayo *et al.* (2012) have reported that awareness creation is a key to address the



impacts of climate change in order to build a more adaptive capacity among communities. The findings also indicate that the information obtained from newspapers was perceived useful for helping peri-urban newspaper readers to make various decisions on the matters related to the impacts of climate change (67.3%). Similar findings are reported by Mishra (2012) that an access to climate change information enhances decision making for adaptation to climate change. The results were also confirmed by one key informant who pointed out that:

*“...Newspaper reading provides me with the current news about the impacts of climate change that will enable me to make informed decisions on the suitable adaptation, coping and mitigation strategies to be employed...”* (Key Informant, Chamazi).

Furthermore, respondents had a perception that the information they obtained from newspapers about climate change is useful for providing them with early-warning information such as prior information about the occurrence of drought (64%). Provision of earlier forecast information about drought helps farmers to plan for adaptation measures such as planting drought-tolerant and early maturing crops. Findings further indicate that peri-urban newspaper readers had a perception that the climate change information covered in the newspapers can play the role of sensitising communities that are vulnerable to the impacts of climate change, donors and to help in pulling the necessary resources for climate change adaptation, coping and mitigation mechanisms (48%). Climate change information published in the newspapers can attract climate change stakeholders to direct their resources such as human and financial resources towards climate change adaptation, coping and mitigation strategies. Similar findings are reported by scholars like Tairo (2013) who reported that the print media such as newspapers have a major role to play in sensitising vulnerable communities, donor agencies and African governments in Sub-Saharan region including Tanzania so as to help in pulling resources that will help to reduce the effects of climate change.

Besides, respondents had a perception that the information they obtained from the newspapers can influence attitudes and behaviours of members of the public on the climate change related issues (41.2%). Change of attitudes and behaviours among people and communities is important in understanding the causes, effects and how to deal with the potential impacts of climate change. According to Myhre *et al.* (2013), changing behaviour and attitude towards climate change can promote communities' participation in adaptation, coping and mitigation strategies.

**Table 6: Perceived usefulness of climate change information obtained by the newspaper readers**

Perceived usefulness of climate change information	Frequency	Percent (%)
Increases awareness	127	83.0
Decision making	103	67.3
Provide early warning	98	64.0
Sensitizing vulnerable communities	74	48.4
Influencing attitudes and behaviour change	63	41.2
Reducing information insufficiency	58	38.0
Education and enlightenment	50	33.0
Others	5	3.3

### **3.6 Challenges encountered by peri-urban newspaper readers when accessing newspapers for climate change information in Tanzania.**

The most outstanding challenges that encounter peri-urban newspaper readers in an attempt to access newspapers for climate change information in Tanzania are presented in Table 7. The findings indicate that the limited coverage of climate change information in newspapers is one of the big challenges facing peri-urban

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newspaper readers (87%). Low coverage of information on climate change in Tanzanian newspapers is attributed to low attention given to climate change by Tanzanian newspapers. Climate change information is irregularly covered in Tanzanian newspapers and in most cases no specific pages or special supplements are provided as compared with other information such as advertisements, entertainments, politics and crimes. These findings are also similar to the studies by Siyao and Sife (2018) who reported that Tanzanian newspapers ignore coverage of developmental information while much importance is given to other topics.

Furthermore, respondents pointed out that another challenge is associated with the unreliability of climate change information (84%). Perhaps this is because sometimes the information about rainfall patterns forecast provided in the newspapers by the Tanzania Meteorological Agency (TMA) is not always reliable and it is not also timely received. In one of the KII at Melela Village at Mvomero, one villager opined that ...

*“...Sometimes we receive wrong information about the amount of rainfalls, when they will start and stop raining from newspapers. With a great surprise, we do not necessarily experience the predicted amount of rainfalls and they do not start as according to the predictions. These kinds of information make us feel that we are misled and thus resulting into mistrust of rainfall predictions information obtained from the newspapers...”*(Key informant interview, Mzumbe Ward).

This finding is supported by Muema *et al.* (2018) who reported that lack of trust and unreliability of the climate information services are the main hindrances to the utilisation of climate information services. The finding is also in resonance with that of Elia (2014) who reported that sometimes farmers tend to criticize the truthfulness of the information they receive from the TMA for not being explicit on the rainfall distribution in a given geographical locations and seasons. This suggests the need for the people to be provided with reliable, trusted and understandable information on climate change for utilising it to adapt cope and mitigate against climate change.

**Table 7: Challenges encountered by peri-urban newspaper readers when accessing newspapers for climate change information**

Challenges	Rating (Number & Percentage)						
	Agree		Disagree		Neutral		
	n	No.	%	N o.	%	N o.	%
Limited coverage of climate change information	148	133	87.0	14	9.2	1	0.7
Unreliability of climate change information	143	128	84.0	12	7.8	3	2.0
Inadequate prominence of climate change information	150	126	82.0	22	14.4	2	1.3
Cost barriers	149	122	78.0	23	15.0	2	1.3
Inadequate journalist’s knowledge of climate change issues	144	112	73.0	26	17.0	6	4.0
Shortage of information centres and public libraries	138	111	72.5	23	15.0	4	3.0
Language barrier	145	77	50.0	63	42.2	5	3.33
Other challenges	98	54	35.3	40	26.0	4	3.0

The low prominence of climate change information attached to Tanzanian newspapers was also reported as an important challenge (82%). This is attributed to the fact that climate change information is not often given the priority it deserves in the Tanzanian newspapers. Only few climate change articles are placed in the front pages of the Tanzanian newspapers. In one of the key informant interview one respondent commented that...

*"... Most of the newspapers readers assemble in the newspapers selling centres struggling to read the headlines in the front pages of the newspapers in which most of the time they don't get the detailed information..."* (Key informant interview, Mzumbe Ward).

These findings are also similar to the studies by Elia (2018) and Siyao and Sife (2020) who reported a low prominence attached to climate change information in Tanzanian newspapers.

Respondents indicate that they were not able to access newspapers for climate change information because of cost barriers (78%). When asked to indicate the means through which they accessed newspapers, majority (80.3%) of respondents showed that the only means of getting the newspapers was through cash purchase followed by those who could borrow newspapers from friends or neighbours (21.31%). Proper understanding of climate change related information published in the newspapers needs one to consistently buy the newspapers that publish articles with such information. According to Lunyelele *et al.* (2016), access to information in the newspapers has the direct cost of buying a copy. This may be a barrier for the readers who do not have a stable income to buy sensible newspapers whose prices range from Tzs 1000 to 2000. In one of the KIIs, a participant pointed out that ...

*"...I like reading newspapers but I have a low income that is not enough for me to buy the entire sensible daily or weekly newspapers editions. I can only afford to buy newspapers inclined to sensational information such as Mwanasport and Udaku which are normally sold at very low prices ranging from Tzs 100 to 200..."* (Key informant, Kingolwira Ward, Morogoro).

This is an indication that low income hinders peri-urban newspaper readers to buy newspapers for enabling them to access climate change information. This corroborates the findings by Yohanna *et al.* (2014) who reported that most of the relevant climate change information in the newspapers may not reach the audiences because of the costs barriers. The findings imply that low purchasing power may be a barrier for the peri-urban newspaper readers to access climate change information with regard to adaptation, coping and mitigation strategies published in the newspapers.

Inadequate journalists' knowledge of climate change issues was another challenge cited by peri-urban newspaper readers (73%). Scholars like Diso (2005) have argued that, journalists have the responsibility of producing primary or reproducing secondary information and disseminating it to the general public for consumption. However, peri-urban newspaper readers in this study pointed out that newspaper journalists have inadequate knowledge about climate change science which in turn limits them to cover climate change issues in their newspapers, thus leading to low coverage of climate change information. According to Rioba (2012) and MCT (2017), inadequate journalistic skills and knowledge by Tanzanian journalists tends to affect the critical analysis and coverage of issues including climate change in the newspapers. In one of the KIIs, one respondent who identified himself as a retired journalist commented that...

*"...Low coverage and prominence which is given to climate change information in Tanzanian newspapers is caused by lack of training on subject matter specialization among newspaper journalists. If newspaper journalists are given the training on climate change subject matter, coverage and prominence of such information on the newspapers would increase..."* (Key informant, Mkundi (Kihonda) Ward, Morogoro).

Respondents indicated that there are no community information centres and public libraries in their areas of vicinity (73%). The presence of public libraries and community information centres could be one of the points at which the readers may access the newspapers at a minimal or no cost at all. These findings therefore suggest

that, lack of libraries and information centres in the peri-urban community member's localities may act as one of the constraints in accessing climate change information in the newspapers. Lund (2019) and Agyemang (2017) have also reported that libraries are scarce in the most developing countries. In one of KIIs, one respondent commented that...

*"Libraries and information centres are rarely found in our localities. Nevertheless nowadays some of us have smart phones that are able to access internet networks which can enable us to read newspapers online. The only problem is that the contents of some of the newspapers are limited into few headlines..." (Key Informant, Mlandizi).*

These comments suggest the need for the digitization of all the contents of the newspapers in Tanzania for allowing those who are technologically able to access climate change information online.

Slightly more than half (57.0%) of respondents comprising of 25.5% of those with primary level of education followed by Secondary education (23.5%), Diploma (4.6%) and Bachelor degree and above (3.3%) agreed that language barrier particularly the use of jargons or difficult concepts in explaining climate change issues in the newspapers is yet another challenge. This is perhaps attributed to the fact that sometimes climate change information is written and expressed in technical terms that are difficult for the common people to understand. Lusino *et al.* (2003) reported that climate change information communicated in official and business languages at the expenses of respecting the dominant culture over that of minority groups may not easily be understood by local communities due to the technical complexity of information content and use of technical terms and terminologies. These findings are also in tandem with that of Ndhlovu and Mpofu (2016) who reported that one of the challenges faced by news readers when using media such as newspapers in efforts to get climate change information is rooted in communicating language misunderstanding which is associated with poor translation of climate change issues (Chukwuji *et al.*, 2019). In one of the key informant interviews one pastoralist responded in a complaining manner that ...

*"...All the newspapers we get here are written in Kiswahili and English languages. I have never seen the newspapers written in our local language for enabling us to understand climate change issues in our vernacular language such as Maasai Language..." (Key Informant, Dunda, Bagamoyo).*

These findings demonstrate that there is a dire need of having community newspapers written in other local languages to enhance access and more usage of the information in climate change for those who are not acquainted with alien languages. According to Mubofu and Elia (2017) the use of local languages can enable the effective utilisation of information by farmers.

On the other hand the findings indicate that 42.2% of peri-urban readers comprising of 5.2% of those with Primary level of education followed by Secondary education (8%), Diploma (13.1%) and Bachelor degree and above (16%) disagreed that language is not a barrier for them to access climate change information from Tanzanian newspapers. Perhaps this is associated with the fact that most newspapers are written in Kiswahili which is a common language to many Tanzanians.

#### **4.0 CONCLUSIONS AND RECOMMENDATIONS**

The findings of this study demonstrate that newspapers are important communication channels used by peri-urban newspaper readers to access climate change information for awareness creation and influencing behavioural change about climate change. The mostly used newspapers by the surveyed newspaper readers were *Mwananchi* followed by *Habari Leo*. These newspapers are written in Swahili language which is understood by the majority of readers and also they have high news coverage and circulation. The climate change information obtained from these newspapers was regarded as useful for making informed decisions on adaptation, coping and mitigation measures. However inadequate coverage and low prominence attached to

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climate change information, cost barriers, shortage of community information centres and public libraries, inadequate journalist's knowledge of climate change issues and language barriers are the challenges that impede full access to newspapers for climate change and other developmental information by peri-urban community members.

The study concludes that peri-urban newspaper readers prefer to use newspapers written in Swahili language and those with high news coverage. These newspapers enable timely access to information on climate change for awareness creation and influencing behavioural change among peri-urban newspaper readers as a prerequisite for finding solutions posed by potential impacts of climate change. Nevertheless, the challenges that impede full access to newspapers for climate change information by peri-urban newspaper readers in Tanzania should be overcome.

It is therefore recommended that climate change information generators such as TMA should repackage and disseminate reliable forecast information that addresses the needs of the general public through popular and newspapers with national status. Besides, national and local government authorities in Tanzania should provide support to public libraries and to establish community information resource centres in peri-urban areas for enabling newspaper readers to access climate change and other developmental information.

Although the study was limited to the assessment of the use of newspapers in accessing climate change information by the selected peri-urban newspaper readers in Tanzania, the outcome of the study has shed more light on the challenges of providing climate change information through newspapers in Tanzania.

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