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Abstract

Purpose – This study was conducted to analyse the extent at which Tanzanian newspapers paid attention to climate change information over the period of 10 years between January 2006 and December 2015.

Design/methodology/approach – Six Tanzanian newspapers were quantitatively content analysed for frequencies of coverage to climate change information.

Findings – The results indicate that of total six Tanzanian newspapers had very few (684; 0.84 per cent) articles on climate change which is an average of 68.4 articles per year. Much attention was given to entertainment (24,331; 30 per cent) followed by miscellaneous (19,413; 24.0 per cent) and advertisements (18,112; 22.3 per cent). The Pearson's chi-square test indicates that there was a significant difference in $\chi^2 =$ 21,765, p-value $<$ 2.2e −16 between the level of coverage of climate change articles on other topics in the selected newspapers.

Research limitations/implications – Scanning the sampled six newspapers for climate change information and recording the results in the code sheet for the period of 10 years was a tedious and time-consuming exercise which demanded researchers and coders to be extremely careful. Also it is possible that the sampling strategy used led to missing some data that would have resulted into different conclusions about each newspaper's coverage on climate change. However, the systematic sampling strategy was applied for a long period, that is, 40 months for each newspaper that increased the reliability and accuracy of the results and conclusions about the overall trends in each newspaper's coverage of climate change information.

Practical implications – These findings imply that, as the disseminators of information, Tanzanian newspapers did not pay adequate attention to climate change issues. The study concludes that contrary to the fact that climate change is among the threatening phenomena in Tanzania that would commensurate a significant attention in the media, the findings of this study indicate that the volume of coverage devoted to climate change by the newspapers in Tanzania is very low and disproportionate to the level of threat. This leaves a question on the Tanzanian newspapers' dedication to reporting climate change information. It is therefore recommended that newspapers' media owners, editors and journalists should be environmental nationalistic enough to frequently report climate change information, and the scope of the government-owned newspapers should be revisited to ensure more coverage of climate change information in their publication which can be done by having a section specifically dedicated for climate change issue.

Originality/value – This study has therefore contributed to the growing body of analytical research knowledge on the role of newspapers in the dissemination of climate change information in Tanzania. This study has also highlighted the importance of taking into account newspapers coverage of climate change information which can further be used for policy recommendations to improve the climate change information communication system through the use of newspapers and show the credibility of the newspapers in creating awareness of climate change in Tanzania.

Keywords Content analysis, Tanzania, Newspapers, Coverage, Climate change, Attention

Paper type Research paper

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Introduction

Climate change is a global threatening phenomenon caused by various activities such as deforestation, industrialization, transportation, electricity production and agriculture. These activities lead to the production of greenhouse gases that contribute to increased temperatures which in turn lead to global changes in climatic conditions (IPCC, 2007). Generally, all countries face the consequences of climate change, though they may be affected at different levels. Tanzania has felt the impacts of climate change such as recurrent and prolonged droughts, floods and erratic heavy rainfalls. These have in turn resulted into disease outbreaks, destruction of settlements and infrastructure, deaths of people and animals and land resources degradation, among many other effects (IPCC, 2007; URT, 2012; URT, 2013). As a result, climate change has received attention by various actors including governments, non-governmental organizations (NGOs), politicians, researchers and scientists, particularly on how to establish adaptation and mitigation strategies.

Access to reliable, timely and up-to-date information on climate change is necessary for raising awareness about the impacts of climate change, planning for adaptation and mitigation strategies (Cruce, 2007; GLCA, 2009; Dinshaw *et al.*, 2012) and better management of climate change related risks (Debela *et al.*, 2015). Dissemination of information on climate change is necessary to enable the understanding of the scope of climate change, its impact on the socio-economic and environmental stability and adaptation and mitigation strategies to be used (Corner, 2011; Jiyane and Fairer-Wessels, 2012). Appropriate communication channels are therefore needed to disseminate this kind of information to various groups of audiences. Some of such channels include television, radio, mobile phones, Web services and print media such as brochures, leaflets, newsletters and newspapers.

Newspapers are print or online publications that are issued at regular intervals usually daily or weekly, and they contain articles on various subjects. They are among the most widely-read periodicals that are available and accessible to many people who use them as a tool for expressing ideas and exchanging information (Wilson, 1995; Antilla, 2005; URT, 2015). Newspapers can play a central role in raising awareness, informing, educating and influencing behavioural change in people and communities (Schmidt *et al.*, 2013; Chand, 2017). When compared to other popular media such as radio and television, print newspapers have additional advantages of providing flexibility in reading as they can allow a reader to go back to it, refer to it, read, review and study the material at his/her own pace and convenient time (Dolsak and Houston, 2014). They can also provide sustained and prominent coverage to a particular subject (Boykoff and Boykoff, 2007; URT, 2012; Aiyesimoju and Awoniyi, 2010). It is therefore expected that the attention given to climate change information by newspapers may influence readers' understanding and behaviours towards climate change and promote adaptation and mitigation practices (Myhre *et al.*, 2013).

In the context of this study, attention refers to the number of times the media publish pieces of news items on a given issue which provides a cumulative volume of attention given to an issue (Kiousis, 2004; Schäfer *et al.*, 2014). This dimension of media is often measured by the total number of stories containing particular topic which appear anywhere in the newspapers during specific periods (Lim, 2010). Attention is a basic media quantitative measure where more attention or high frequencies signify that the issue is relevant or very important, and this affects the awareness of the general public and the priority given to an issue (Schmidt *et al.*, 2013). On the other hand, few and infrequent covered stories can cause the subject to be ignored by the audience thinking that the issue is not very important to them (Dotson *et al.*, 2012).

In Tanzania, the newspaper industry can be traced back to the year 1888 when the first newspaper named *Msimulizi* (the storyteller) was published by the Anglican Universities' Mission to Central Africa in Zanzibar (Sturmer, 1998). In 1957, *Sauti ya TANU* (the voice of TANU) newspaper which was owned by a political party known as Tanganyika African National Union (TANU) was founded and was printed in Kiswahili. On the Tanganyika's Independence Day (9 December 1961), *UHURU* (independence) newspaper replaced *Sauti ya TANU*. In 1972, the *Daily News* and *Sunday News* became the English language government-owned newspapers which were published daily and weekly, respectively. It was in the same year that TANU decided to establish a weekly newspaper known as *Mzalendo* (the patriot). In 1990s, the media industry in Tanzania experienced dramatic changes leading to an increase in the number of newspapers (Murthy, 2011; Kweka, 2013). By October 2015, there were 39 registered newspapers comprising 14 English and 25 Kiswahili language published newspapers (URT, 2015).

Despite the fact that newspapers make an important communication channel for disseminating information, there are concerns in many countries that important developmental topics such as climate change are often given inadequate coverage and attention (Harbinson *et al.*, 2006; Shanahan, 2009; Schäfer *et al.*, 2014; Anderson, 2009; Diedong, 2013; Yadav and Rani, 2011; Kakonge, 2011; Tshabangu, 2013; Tagbo, 2010; Mare, 2011; Murthy, 2011; Tairo, 2013). In Tanzania, the level of importance attached to climate change information by newspapers is not documented. This study was therefore conducted to analyse the level of attention given to climate change information by Tanzanian newspapers in the period of 10 years between 2006 and 2015. Specifically, this paper focusses on the level of attention given to different topics, climate change articles by each newspaper, number of climate change articles for each year and various climate change themes covered.

Methods

This study used content analysis method to systematically analyse the occurrences of climate change issues and how these occurrences were distributed in six Tanzanian newspapers. Attention was then calculated as the number of articles mentioning climate change as a proportion of the absolute number of articles published in a given newspaper for all 10 years. The population of this study was 39 newspapers published in Tanzania between January 2006 and December 2015. The units of analysis were climate change articles that contained key terms associated with "climate change" or "mabadiliko ya tabia nchi" in Kiswahili, and many other terms which were translated and indigenised to reflect climate change.

Purposive sampling technique was used to select six newspapers out of 39 registered newspapers for content analysis. The newspapers were selected based on characteristics such as nation-wide coverage, reach and countrywide circulation, existence for at least 10 years and consistency in publishing their editions (Table I). The duration from 2006 to 2015 was purposively selected because this is the time in which important national and international events on climate change were marked. Such events include but are not limited to National Adaptation Strategy and Action Plan in 2009, an Inconvenient Truth and The Stern Review on the Economics of Climate Change in 2006, the United Nations Climate Change Conference held in Copenhagen in 2009 and National Climate Change Communication Strategy in 2012.

To obtain the number of newspapers for the study, a month was randomly picked up from each quarter in a year, leading to 40 months (1,200 days) in 10 years. For the daily published newspapers, two days were randomly selected by using lottery method in each

Newspapers	Selection criteria: Ownership – Private	Ownership – Government	Language – English	Language – Kiswahili	Frequency – Daily	Frequency – Weekly	Publisher	Circulation per day (copies)
Daily news		√	√		√		TSN (Government)	50,000
The Guardian	√		√		√		IPP media (private)	20,000
Mwananchi	√			√	√		MCL (private)	40,000
Habari Leo		√		√	√		TSN (Government)	6,500
Rai	√			√		√	New Habari (private)	1,000
This Day	√		√			√	IPP media/media solutions (private)	4,000

Table I.
Selected newspapers

Source: MSI (2012); Simon and Ryan (2013); MISA (2017)

week making a total of 1,280 editions for all four daily newspapers. For each weekly published newspaper, one edition per each week was picked up making a total of 160 editions for 10 years. The final study sample of the selected newspaper editions was therefore 1280 + 320 = 1,600 editions which is 10.41 per cent of the total estimated population of 15,360 editions (Table II). A sample size between 10 per cent and 25 per cent is recommended as acceptable when determining sample size in content analysis (Wimmer and Dominick, 2011). Data for this study were collected between November 2016 and April 2017.

Analysis of climate change articles in Tanzanian newspapers followed the methodology outlined by Di Gregorio *et al.* (2012) which is based on a predefined code book in which newspapers contents were manually collected through reading newspapers (Figure 1).

To avoid subjective judgment that would result from a single researcher to perform the task of coding in content analysis studies, two coders with a qualification in library and information studies were trained, and they used a code book to record the coverage of climate change information. To ensure that coding sheet instrument was reliable, pilot test and code book review were conducted. Intercoder reliability test which determined the

Newspapers' category	No. of newspapers	Estimated total number of editions for 10 years	Sampled number of editions per year	Total number of editions selected for 10 years
Dailies	4	4 × 30 ×12 × 10 = 14,400	2 × 4 × 4 × 4 = 128	128 × 10 = 1,280
Weeklies	2	2 × 4 ×12 × 10 = 960	2 × 4 × 4 = 32	32 × 10 = 320
Total	*6*	*15,360*	*160*	*1,600*

Table II.
Sample tabulation

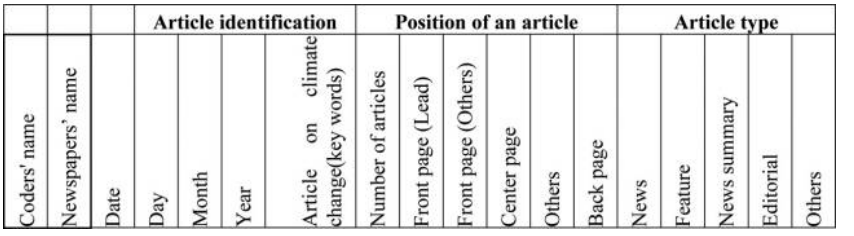

Figure 1.
Code book adapted from Di Gregorio *et al.* (2012)

degree of agreement between the researcher and research assistants in the coding process was also conducted. Holsti's coefficient was calculated by dividing the total number of occurrences or agreed on values for each variable into the sum of the responses of each coder for the same variable (Holsti, 1969), and thus, an acceptable intercoder reliability which fall between 0.75 and 0.80 was achieved (Neuendorf, 2002). Statistical data analysis was done using IBM SPSS Statistics and excel spreadsheet. Descriptive statistics such as mean and frequencies and inferential statistics such as ANOVA, chi-square test and correlation were used in analysis.

Results and discussion

The study findings in Table III indicate that there were a total of 81,162 articles in all six newspapers for 10 years. *The Guardian* had the highest (24,816; 30.57 per cent) proportion of all articles followed by *Daily News* (22,234; 27.39 per cent) and *Mwananchi* (18,297; 22.54 per cent). *This Day* had the lowest (623; 0.77 per cent) number of articles followed by *Rai* (556; 0.68 per cent). The results indicate that these six Tanzanian newspapers had very few (684; 0.84 per cent) articles on climate change which is an average of 68.4 articles per year. Much attention was given to entertainment (24,331; 30 per cent) followed by miscellaneous issues such as environment and socio-economic issues (19,413; 24.0 per cent) and advertisements (18,112; 22.3 per cent). The Pearson's chi-square test indicates that there was a significant difference in $\chi^2 = 21{,}765$, p-value $< 2.2e-16$ between the level of coverage of climate change articles on other topics in the selected newspapers. These findings show that Tanzanian newspapers did not pay adequate attention to climate change issues. That is to say, Tanzanian newspapers did not effectively play their role of informing, educating and enlightening people about climate change.

The findings indicate further that the newspapers with higher total number of articles had high proportions of climate change articles. These are *The Guardian* (157; 0.19 per cent), *Mwananchi* (139; 0.17 per cent), *Daily News* (138; 0.17 per cent) and *Habari Leo* (132; 0.16 per cent). On the other hand, newspapers with lower total number of articles had relatively low proportions of climate change articles. The newspapers are *Rai* (26; 0.03 per cent) followed by *This Day* (92; 0.11 per cent) (Table III). This suggests that there is more coverage of articles on climate change in newspapers that produce many articles and low coverage in the newspapers that produce few number of articles.

Comparisons were made on the level of attention given to climate change information by the newspapers with respect to language, frequency of publication, ownership type and years of publication. The results in Figure 2 indicate that the three English published newspapers covered 57 per cent of all climate change articles for 10 years. On an average, *The Guardian* had 23 per cent of all climate change articles followed by *Daily News* (20 per cent) and *This Day* (14 per cent). On the other hand, the three Kiswahili newspapers had 43 per cent of all articles on climate change. *Mwananchi* had 20 per cent of all articles followed by *Habari Leo* (19 per cent) and *Rai* (4 per cent). English published newspapers in this study were broadsheets with larger carrying capacities, whereas Kiswahili published newspapers were tabloids whose measures were 11 × 17 inches narrower than broadsheet newspapers. The findings in this study however were contrary to those of Henry and Gordon (2001) and Schäfer *et al.* (2014) who observed that the carrying capacity of newspapers is sometimes limited because of limited numbers of pages which make the newspapers to give attention to small number of some issues at any point in time.

With respect to newspapers ownership, the study results in Figure 2 indicate that the government-owned newspapers covered only 39 per cent of all climate change articles, whereas the privately owned newspapers covered 61 per cent of all climate change articles.

Table III.
Level of attention given to different topics in Tanzanian newspapers

Newspaper	No. of articles (n = 81,162) Climate change	Politics	Crime	Entertainment	Advertisement	Business	Miscellaneous	Total no. of articles	(%)
The Guardian	157	402	489	8,140	5,834	4,980	4,814	24,816	30.57
Daily News	138	250	270	4,335	5,358	6,412	5,471	22,234	27.39
Mwananchi	139	359	314	5,945	4,333	2,684	4,523	18,297	22.54
Habari Leo	132	315	484	5,723	2,391	1,205	4,386	14,636	18.03
This Day	92	85	99	84	84	78	101	623	0.77
Rai	26	143	53	104	112	0	118	556	0.68
Total	*684*	*1,554*	*1,709*	*24,331*	*18,112*	*15,359*	*19413*	*81,162*	*100*
(%)	*0.84*	*2*	*2.1*	*30*	*22.3*	*18.9*	*24*	*100*	

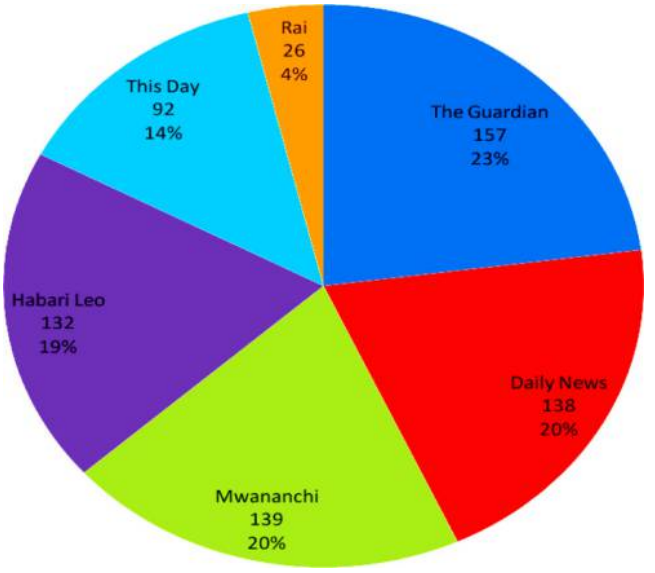

Figure 2.
Proportion of climate change information articles per each newspaper

Government-owned newspapers are somehow service-oriented, and it was therefore expected that they take a lead as disseminators of developmental information including that on climate change. According to Tagbo (2010) and Gicheru (2014), government-owned newspapers are often obsequious to what is known as development journalism which is the kind of reporting whose sole aim is to promote development issues.

With regard to the frequency at which the newspapers are published, the results in Figure 2 indicate that daily newspapers covered 82 per cent, whereas their counterparts' weekly published newspapers covered only 18 per cent of articles on climate change. The findings suggest that daily published newspapers have more articles, whereas observations found that weekly published newspapers have reported fewer but detailed articles. These results are similar to the findings reported by Lacy *et al.* (2012) which indicate that newspapers with daily printing provided the most consistent coverage compared to weekly published newspapers.

Comparison on the level of coverage given to climate change information by the newspapers per year was made. Results in Figure 3 which shows the combined total

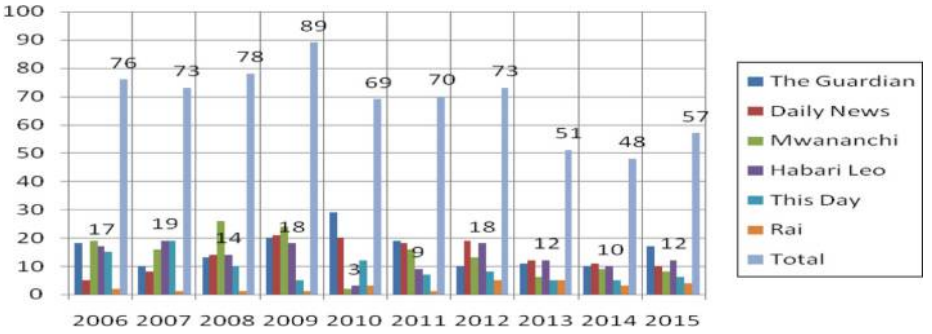

Figure 3.
Coverage of climate change information per year

frequencies of articles in the six newspapers indicate that the number of articles on climate change was high in the year 2009 followed by 2008 and 2006. Less number of articles were published in the year 2014 followed by 2013. As pointed out earlier, the high coverage may be associated with the occurrence of national and international events and milestones on climate change. This suggests that whenever there are such events, the newspapers tend to cover more articles, and fewer articles are covered in the non-existence of such events.

Table IV indicates different themes associated with climate change issues that were reported in Tanzanian newspapers for the period of 10 years. Change in the state of climate had 25.4 per cent of all climate change articles followed by floods (23 per cent), rains (15.5 per cent) and drought (14 per cent). Adaptation strategies reported only 7.9 per cent of all articles. These results suggest that over the period of 10 years, Tanzanian newspapers concentrated much in reporting the climate change themes, whereas low reportage was attached to adaptation strategies theme which might be more relevant for raising awareness and educating the public on how to adapt to the adverse impacts of climate change. These results are in agreement with that of Takahashi and Martinez (2017) who reported that climate change information receives greater attention in the media when disasters like heavy rainfalls, floods and droughts strike, but adaptation strategies are not consistently reported which is an indication of the low priority given to climate change reporting.

Conclusion and recommendations

Based on the premise that media play a crucial role in the dissemination of information, research was carried out to analysis the level of attention given to climate change information by Tanzanian newspapers between 2006 and 2015. Despite the fact that climate change is among the threatening phenomena in Tanzania that would commensurate a significant attention in the media, the findings of this study indicate that the volume of coverage devoted to climate change by the newspapers in Tanzania is very low and disproportionate to the level of threat. This leaves a question on the Tanzanian newspapers' dedication to reporting climate change information.

It is therefore recommended that despite the fact that print media houses are independent business enterprises which cannot be compelled to cover certain information, as it may infringe the right to freedom of expression; newspapers media owners, editors and journalists should however be environmental nationalistic enough to frequently report climate change information. The environmental citizenship spirit will enable the newspapers to consider playing an important role in providing the right amount of information on climate change in Tanzania without biasness and largely being events oriented. The study recommends more readerships of the daily published newspapers than their counterparts' weekly published newspapers. Daily published newspapers can frequently disseminate climate change information to the intended audiences, as opposed to weekly newspapers that publish this aspect irregularly but in a more detailed manner. Furthermore, as the United Republic of Tanzania's Government is committed to fight against the menace brought about by the climate change, the scope of the government-owned newspapers should be revisited to ensure more coverage of climate change information in their publication. More emphasis should also be placed in Kiswahili published newspapers which can be done by having a section specifically dedicated for climate change issues. Kiswahili is a national language in Tanzania, and thus, more coverage of climate change in these newspapers will ensure that the climate change information reaches majority of the consumers.

Table IV. Occurrence of different themes of climate change issues by each newspaper

Newspaper	Themes of climate change issues (n = 684)													
	Change in the state of the climate	Drought	Rains	Adaptation strategies	Floods	Kyoto Protocol	Heat stress	Global warming	Greenhouse gases	Eli Niño	Winds	Climate bills	Climate change conferences	Total
Mwananchi	16	26	34	18	32	2	3	0	2	0	2	0	4	*139*
Daily News	54	11	14	1	42	1	1	7	1	0	5	1	0	*138*
The Guardian	48	18	20	0	36	0	2	9	5	0	12	4	3	*157*
Habari Leo	30	22	22	9	26	0	2	5	6	3	6	0	1	*132*
This Day	21	16	10	19	18	0	0	2	5	0	1	0	0	*92*
Rai	5	3	6	7	3	0	0	1	1	0	0	0	0	*26*
Total	*174*	*96*	*106*	*54*	*157*	*3*	*8*	*24*	*20*	*3*	*26*	*5*	*6*	*684*

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