



Research Article

This article is published by
JAH, *Journal of Arts and*
Humanities, Volume 5, N. 1,
Sept., 2021.

ISSN: 2710-3013 (Print)

ISSN: 2788-6360 (Online)

This article is distributed
under a Creative Common
Attribution (CC-BY NC-SA)
4.0 International License.

Article detail

Received: Nov. 17th, 2021

Accepted: Feb. 11th 2022

Published: March 5th 2022

Conflict of Interest: The
author/s declared no conflict
of interest



Role of Communication Media in Climate Variability and Change within Bamenda, North West Region, Cameroon

By

Tanwie Talom Gilbert

Department of Communication &
Development Studies, Faculty of Arts,
The University of Bamenda
(pepperish@gmail.com),
Tel. 00237652679690

Suiven John Paul Tume

Department of Geography and Planning,
FA, The University of Bamenda
(wantume@gmail.com),
Tel. 00237679957312

Romarc Bongwong Tume

Department of Communication &
Development Studies, FA,
The University of Bamenda
(rtume41@gmail.com),
Tel. 00237696329074

*Corresponding author: wantume@gmail.com

ABSTRACT

Climate variability and change today has been an international debate issue with communities worldwide presenting awareness deficiency as far as climate change is concerned. The study seeks to

assess the extent of climate variability in Bamenda, analyse the programs broadcasted about climate change, investigate the level of receptiveness from the audience and probe into other ways that the media is engaging the population apart from message dissemination in climate variability and change perspectives. A purposive sample of 33 was drawn from 22 media outlets, while climatic data were collected from the North West Regional Meteorological Service in Bamenda. Results revealed that rainfall has been decreasing while the temperature has been rising. The radio is the most popular media used in climate communication (39.4%), followed by a combination of radio/TV (15.2%), online (15.2%), print (15.2%), TV only (9.1%) and a combination of print and online (6.15). Climate change communication is plagued by inadequate personnel, non-mastery of the science, inadequate slots and poor coverage. Faced with these, the media should intensify the production, broadcast and publishing of climate change content.

Keywords: *Climate change, communication, environment*

1. INTRODUCTION

The communication world has been somehow quiet on the pertinent issue of climate change till the emergence of recurrent weather events that plague the earth every day (Tume *et al.*, 2018). The media in the North West Region of Cameroon has not been giving enough attention to environmental issues because most media houses are commercial and thus, usually produce content and programs that would generate profit and capital for its sustenance (United Nations Framework Convention on Climate Change-UNFCCC, 2006). With relatively few organizations and groups that can provide funding for climate change programs, this genre tends to be ignored by most of these media houses (Ward and Menezes, 2010). Even when such organizations come up with climate change activities involving the media, the space between such events is usually very long (Tume *et al.*, 2018).

Climate change communication in Sub-Saharan Africa has often focused on weather extremes such as floods and droughts, without

adequately addressing the targeted audiences and stakeholders. Tume *et al.*, (2018) argued that effective climate change communication must be holistic, targeting stakeholders such as the media, civil society, traditional leaders and mainstream public services whose activities hinge directly on the environment, such as Environment, Nature Protection and Sustainable Development, Agriculture and Rural Development, Forestry and Wildlife, Water and Energy. Targeted audiences should address those who are most vulnerable to the least climate and environmental triggers, such as rural farmers, whose livelihoods depend on natural resources exploitation. Such an approach will build their resilience and help in climate change adaptation through timely dissemination of weather and climate information for decision-making (Wandera, 2018; Chirisa *et al.*, 2018; Tanyanyiwa and Madobi, 2018).

In assessing the role of communication media in climate variability and change in Bamenda, the following objectives provided a niche for the investigation: (1) assess the extent of climate variability in Bamenda, (2) analyse the programs broadcasted about climate change, (3) investigate the level of receptiveness from the audience, (4) probe into other ways that the media is engaging the population apart from message dissemination in climate variability and change perspectives.

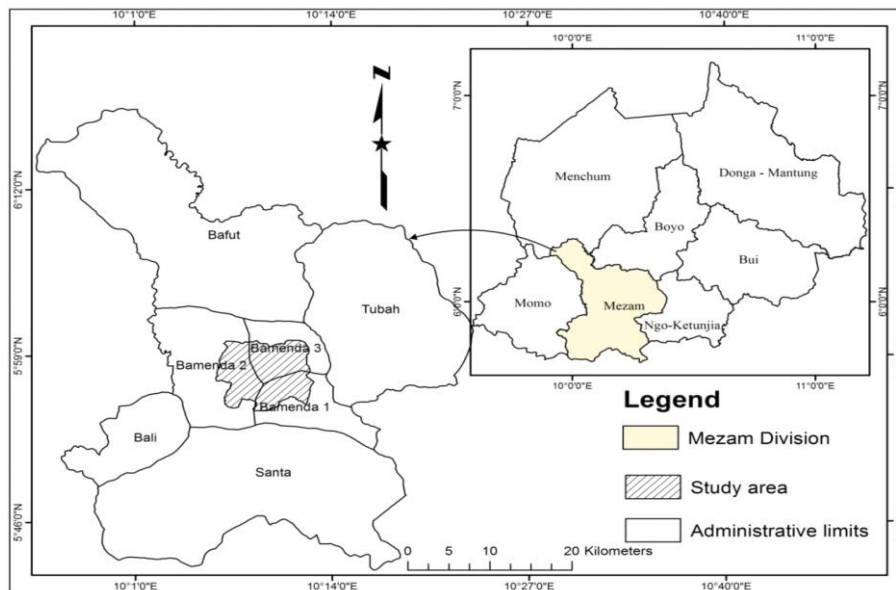
2. STUDY AREA AND METHODOLOGY

Bamenda is the headquarters of the North West Region and the socio-economic nerve wire of the region. Bamenda is a primate city considering her situation which is gradually merging with satellite towns like Bambui, Bambili, Bafut, Mbengwi, Bali, Bafut and Santa. The study area covers three Sub-Divisional Councils (Bamenda I, Bamenda II, Bamenda III). It is located between longitudes 10°09" and 10°11"E of the Greenwich Meridian and between latitudes 5°56"N and 5° 58"N (Figure 1). Bamenda is home to many media houses, ranging from television, radio, print and electronic. The most popular amongst these is the radio due to their outreach and ability to broadcast in the various local languages.

a. Methodology

The main population in the focus are media houses and organs in Bamenda, ranging from audio-visual to print and online. A purposive sample of 33 personnel was drawn from 22 media houses using a hybrid questionnaire format. A list of media houses in the North West Region was collected from the Regional Delegation of Communication. These were selected because of their relative accessibility and willingness to participate in the survey. Secondary data was gotten from published documents from where literature was referenced. Climatic data (rainfall-1963 to 2019 and temperature-1975 to 2005) were collected from the Regional Meteorological Service for the North West to show the climatic trends. To come up with coherent qualitative and quantitative results, statistical analyses were performed in the Statistical Package for Social Sciences (SPSS), Version 20. The climatic data were specifically analysed in Microsoft Excel 2016. The results were presented in tables and graphs.

Figure 1: Location of Bamenda



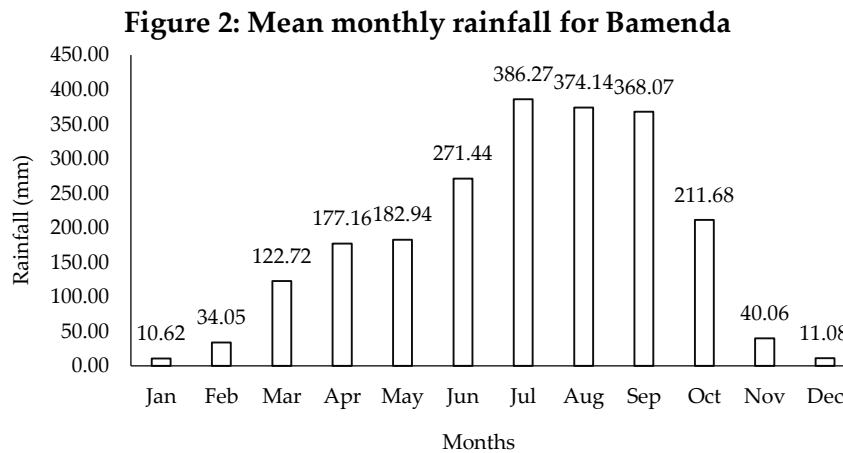


3. RESULTS

The results for this paper are presented under climate variability in Bamenda, types of media houses sampled, climate change communication, public reception of climate change messages and media awareness of climate and environmental international days.

a. Climate Variability and Change in Bamenda

Rainfall in Bamenda increases from the onset of the wet season to a peak in July to September and gradually drops as the dry season sets in (Figure 2).



The lowest rainfall is recorded from December to March. To assess rainfall change, the data were grouped into 3-month segments (Table 1).

Table 1: Rainfall change over Bamenda (1963-2019)

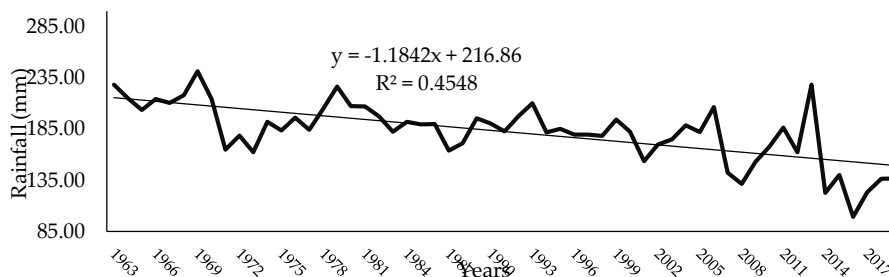
Months	Decadal mean rainfall (mm)					
	1963-1972	1973-1982	1983-1992	1993-2002	2003-2012	2013-2019
DJF	25.07	19.85	16.5	9.7	17.71	24.5
MAM	184.17	161.78	158.82	149.1	138.9	178.01
JJA	387.6	361.9	364.2	356.4	325.9	235.06
SON	238.81	240.9	202.5	210.9	195.97	126.5
Mean	208.91	196.11	185.51	181.53	169.62	141.02
Change	26.39	13.59	2.98	-1.00	-12.90	-41.50



DJF: December, January, February; MAM: March, April, May, JJA: June, July, August, SON: September, October, November

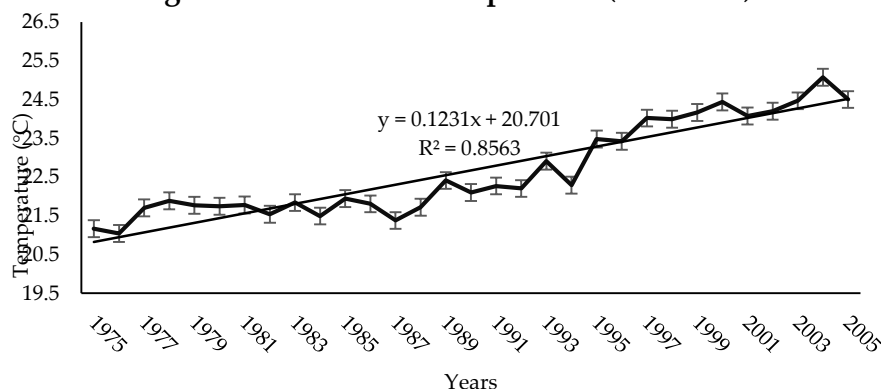
From 1963-1972, rainfall had an excess of 26.39 mm and has been declining over time. Between 1973-1982, the rainfall had dropped by 13.59 mm and 2.98 mm from 1983-1992. Since 1993, Bamenda has witnessed rainfall deficits (-1 mm from 1993-2002, -12.9 mm from 2003-2012 and -41.5 mm from 2013-2019). The average rainfall declined from 1963-2019 is **-2.07 mm**. This proves that the climate is changing and is affirmed by the declining inter-annual rainfall trend (Figure 3). The trend in the inter-annual rainfall decline is determined by the Coefficient of Determination (R^2) which stands at 45.4%.

Figure 3: Inter-annual for Bamenda (1963-2019)



Temperatures have been increasing in Bamenda (Figure 4). This is supported by Trenberth *et al.*, (2007), who revealed that global mean surface temperature has increased since the late 19th Century.

Figure 4: Inter-annual temperature (1975-2005)



Inter-annual temperatures have been continuously fluctuating between the periods 1975 to 2005. In the mid-1970's temperatures were 20.5°C which gradually increased above 21.5°C. The period 1975 to 1981 was characterized by steadily increasing temperatures (21.5°C) which eventually started dropping gradually (21.5°C to about 20.5°C from 1983-1995). Since then, there has been a rapid increase in temperatures (23.5°C to 24.5°C) especially from 1997 to 2005 which seem to have continued till today. The minimum and maximum temperatures from 1975 to 2005 were 20.5°C and 25.55°C respectively. These temperature increases in Bamenda is in line with the global temperature increases.

This continuously increasing temperature is explained by a variety of human-related activities such as global warming, deforestation, population increase and agricultural activities to name a few. The quest by man to meet the needs of the continuously growing population through agricultural practices such as burning (*ankara* system) has led to the increase of greenhouses gases like CO₂ into the atmosphere thereby leading to increasing temperatures at local and global levels. The effects of increasing temperatures are enormous and affect individuals, communities, nations and the globe at large.

b. Types of media houses samples

There are many media houses in the city of Bamenda. Twenty-two were sampled for this study (Table 2). Those represented with more than one frequency are the ones with which more than one staff was sampled, giving a total of 33 personnel.

Table 2: Distribution of questionnaires according to media houses

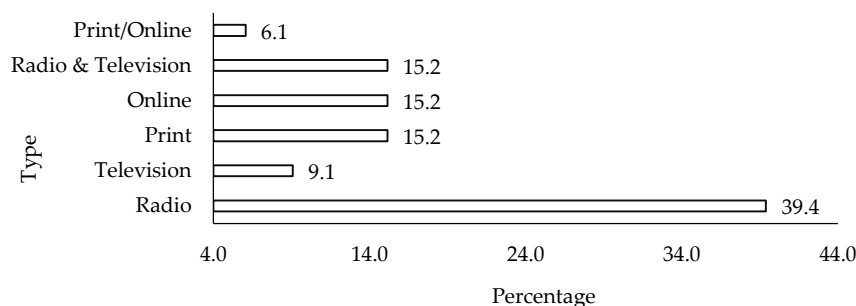
Media house	Frequency	Percentage
Sky Sports Community Radio	1	3.0
The Observer	2	6.1
City FM	2	6.1
CRTV North West	3	9.1
Foundation Radio	3	9.1
CBC Radio	2	6.1
The Median	2	6.1
NDEFCAM Radio	2	6.1
Viewpoint	2	6.1



Eden Newspaper	2	6.1
The Post	1	3.0
The Voice	1	3.0
The Executive	1	3.0
CY Blog	1	3.0
Radio Evangelium	1	3.0
Rush FM	1	3.0
Abakwa FM	1	3.0
The Eye Newspaper	1	3.0
Radio Hot Cocoa	1	3.0
Afrique Nouvelle	1	3.0
The Guardian Post	1	3.0
CBS Radio	1	3.0
Total	33	100.0

The radio accounted for a whopping 39.4% of the media houses sampled, corresponding to twice the percentage of others (Figure 5). This difference is its cost-effective factor, as well as its ability to reach a wider audience than other media organs.

Figure 5: Type of media houses sampled



Some of the radio stations also broadcast content in many local languages, thus giving them an added advantage in terms of outreach (especially with the uneducated people) over the likes of TV, print and online. The print, online and Radio/TV are the next most popular with 15.2% each, which is followed by Television with 9.1% and online/print with 6.1%.

3.3. Climate Change Communication

Various climate-environmental focused programs are broadcasted or published by the media houses (Table 3).

Table 3: Climate-Environmental Focused Programs in Bamenda

Items	Yes		No	
	Frequency	%	Frequency	%
Daily weather forecast broadcast	10	30.3	23	69.7
Climate specific programs	10	30.3	23	69.7
Other environmental-related programs	31	93.9	2	6.1
Public perception of climate change messages	20	60.6	13	39.4
Use of social media to communicate climate change	13	39.4	20	60.6
Necessity of introducing climate change education	25	75.8	8	24.2

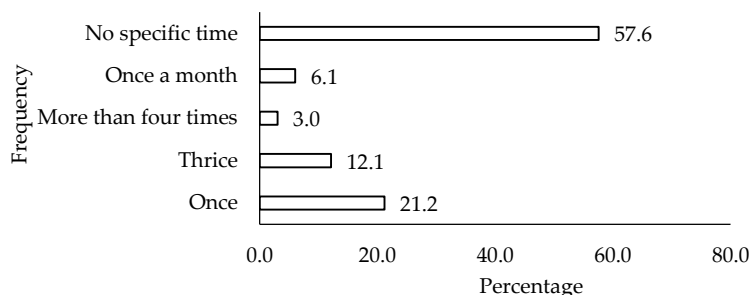
From the sampled media houses, 69.7% as opposed to 30.3% do not publish or broadcast daily weather forecasts. Again, 69.7% as opposed to 30.35 broadcasts or publish climate-specific content, while a reasonable 93.9% channel other kinds of environmental-related content. There is only 39.4% utilization of social media to communicate climate change. The results showed that 60.6% of the population received messages on climate change, along with a 75.8% acceptance rate by the media personnel on the need for climate change to be introduced and integrated into education. Some programs, columns and posts broadcast and published by the various media houses are as follows (Table 4):

Table 4: Climate-environmental programs broadcasted by media houses in Bamenda

Media house	Programs
Sky Sports Community Radio	Sustainable World
City FM	Climate Change Today
CRTV North West	Wake Up Crew
Foundation Radio	Terra Nostra, Save the Earth
CBC Radio	Our Environment
NDEFCAM Radio	Nature watch, Weather Magazine
Viewpoint	Ecosystems protection
CY Blog	Climate change articles

The broadcast and publication of these climate-environment-related programs are varied (Figure 6).

Figure 6: Frequency of broadcast of climate change programs



Fifty-nine per cent of the content disseminated has no specific time, while 21.2% accounts for content channelled once a week, 12.1% for thrice a week, 3.0% for more than four times a week and 6.1% for once a month. This shows that the frequency of broadcast and publication of climate-related news is relatively slow in Bamenda because most media practitioners do have the skills and knowledge in climate change communication.

3.4. Public reception of climate change messages

The few climate change messages broadcasted and published are appreciated by the public at different levels, that is, high, medium and low. There is an 18.2% high level of reception by the public, 63.6% medium level of reception, and another 18.2% low level of public reception. Results showed an equilibrium reception of climate change content by the public. The levels at which the public take and react to climate change content is variable (Table 5).

Table 5: Public perception of climate changes messages

Perceptions	Yes		No	
	Frequency	%	Frequency	%
Feedback from the audience	14	42.4	19	57.6
Other climate change-related activities	11	33.3	22	66.7
Noticeable changes and reactions	9	27.3	24	72.7

The feedback from the audience rates at 57.6% as opposed to 42.4% for some media houses. Some media houses (CRTV North West, Abakwa FM, Radio Hot Cocoa) are of the view that there has been a noticeable

change and reactions of 27.3% as opposed to 72.7% of there being no change whatsoever. Most media houses limit their climate change communication to broadcast and content creation which is 33.3%, meanwhile, some others engage in other climate change activities out of the studio rooms and suites, accruing to 66.7%.

3.5. Media awareness of Climate and Environmental International Days

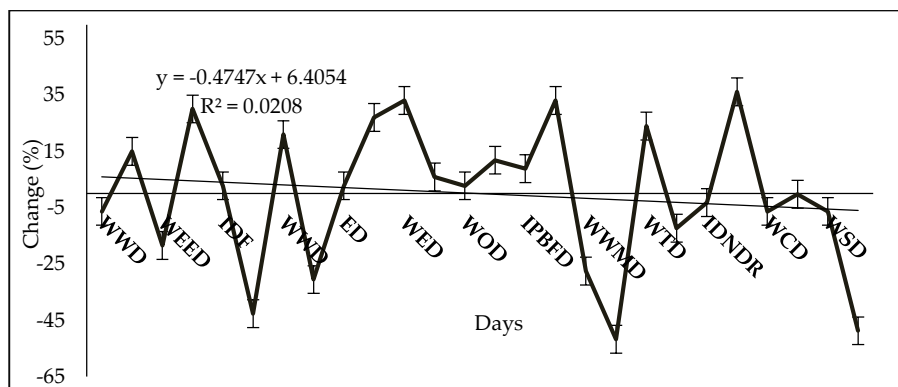
There are several climate and environmental days commemorated each year at the international level. Twenty-six (26) of the days were assessed in this study (Table 6).

Table 6: International climate and environmental days

International days	Dates	Yes		No	
		F	%	F	%
World Wetlands Day	22-Feb	18	54.5	15	45.5
World Wildlife Day	3-Mar	25	75.8	8	24.2
World Energy Efficiency Day	5-Mar	14	42.4	19	57.6
World Recycling Day	18-Mar	30	90.9	3	9.1
International Day of the Forest	21-Mar	21	63.6	12	36.4
World Wood Day	21-Mar	6	18.2	27	81.8
World Water Day	22-Mar	27	81.8	6	18.2
World Meteorological Day	23-Mar	10	30.3	23	69.7
Earth Day	22-Apr	21	63.6	12	36.4
International Day for Biological Diversity	22-May	29	87.9	4	12.1
World Environment Day	5-Jun	31	93.9	2	6.1
World Food Safety Day	7-Jun	22	66.7	11	33.3
World Oceans Day	8-Jun	21	63.6	12	36.4
World Day to Combat Desertification and Droughts	17-Jun	24	72.7	9	27.3
International Plastic Bag Free Day	3-Jul	23	69.7	10	30.3
International Day for the Preservation of the Ozone Layer	17-Sep	31	93.9	2	6.1
World Water Monitoring Day	18-Sep	11	33.3	22	66.7
Car Free Day	22-Sep	3	9.1	30	90.9
World Tourism Day	27-Sep	28	84.8	5	15.2
World Habitat Day	3-Oct	16	48.5	17	51.5
International Day for Natural Disaster Reduction	13-Oct	19	57.6	14	42.4
World Food Day	16-Oct	32	97.0	1	3.0
World Cities Day	31-Oct	18	54.5	15	45.5
International Day for Prevention of the Exploitation of the Environment in Armed Conflicts	6-Nov	20	60.6	13	39.4
World Soil Day	5-Dec	18	54.5	15	45.5
International Mountains Day	11-Dec	4	12.1	29	87.9

More insight into the trend of media is better presented in a time-series graph (Figure 7), which shows the relative awareness of the media of climate-environmental international days.

Figure 7: Trend in media awareness of climate and environment days



WWD: World Wetlands Day, WWD: World Wildlife Day, WEED: World Energy Efficiency Day, WRD: World Recycling Day, IDF: International Day of the Forest, WWD: World Wood Day, WWD: World Water Day, WMD: World Meteorological Day, ED: Earth Day, IDBD: International Day for Biological Diversity, WED: World Environment Day, WFS: World Food Safety Day, WOD: World Oceans Day, WDCDD: World Day to Combat Desertification and Droughts, IPBFD: International Plastic Bag Free Day, IDPOL: International Day for the Preservation of the Ozone Layer, WWMD: World Water Monitoring Day, CFD: Car Free Day, WTD: World Tourism Day, WHD: World Habitat Day, IDNDR: International Day for Natural Disaster Reduction, WFD: World Food Day, WCD: World Cities Day, IDPEEAC: International Day for Prevention of the Exploitation of the Environment in Armed Conflicts, WSD: World Soil Day, IMD: International Mountains Day

The international days that the level of awareness is fluctuating, with an overall decreasing trend with a Coefficient of Determination of 2.08%. This means that the media in Bamenda are not fully aware of all the international climate and environmental days.

3.6. Problems plaguing effective climate change communication in Bamenda

Climate change communication is stifled by the various challenges and problems in Bamenda (Table 7).

Table 7: Problems of climate change communication in Bamenda

Challenges	High		Medium		Low	
	F	%	F	%	F	%
Inadequate personnel	23	69.7	10	30.3	0	0
Non-mastery of the science of climate change	29	87.9	4	12.1	0	0
Inadequate slots	18	54.5	9	27.3	6	18.2
Inadequate coverage	12	36.4	18	54.5	3	9.1

The most pertinent problem is the non-mastery of the science of climate change which accounts for 87.9%. Other challenges include inadequate personnel (69.7%) and inadequate slots (36.4%) in the media for climate communication. The problem of inadequate is medium at a rate of 54.5%.

4. DISCUSSION

Climate variability in the tropics is often marked by precipitation decrease and increasing temperature trends (Inter-governmental Panel on Climate Change-IPCC, 2021), as depicted by the situation in Bamenda. Climate variability and change including increases in frequency and intensity of extremes, has adversely impacted food security and terrestrial ecosystems (IPCC, 2019). According to Tume (2021), rainfall has declined by **2.07 mm** in Bamenda from 1963-2021. This affects rain-fed agricultural systems as changes in trends and variability in rainfall reduce crop productivity (Tume and Kimegnsi, 2021). At the same time, the food system generates negative externalities in the form of greenhouse gas emissions and disruption of ecosystem services. These activities have direct and indirect impacts on climate change and reduced resilience to climate variability of local farmers (Arneth *et al.*, 2019). These intricate issues must be communicated effectively to inform stakeholders in all sectors, especially rural communities whose livelihoods depend on the exploitation of natural resources.

Climate change communication has lately become conspicuous in society from movies to grassroots movements (Ward and Menezes, 2008).



It is a global problem with widespread impacts. Climate change and environmental messages must be communicated effectively by different stakeholders including the media, NGOs, socio-cultural groups, municipal councils and government institutions (Tani and Tume, 2019). It is a fact that even with these alarming threats posed by climate change, there continues to be a denial of the reality of climate change. While this is due to several factors, one most of the most prominent is that of the way information relating to climate change is relayed to the communities.

Climate change is a complex process that is influenced by various variables. Filho (2008) argues that the search for solutions to climate change-related problems can never be one-dimensional. There is a need to take an integrated approach to address the changes as well as communicate information relating to climate change in line with 39.4% of radio dominance of climate change communication in Bamenda. Communication of this phenomenon then has to be a two-way process as the community and society has to actively participate and contribute to the adoption and formulation of strategies that affect their daily lives. Moser (2010) supported this and purported that a communication approach that side-lines society and focuses on scientific facts and technocratic solutions void of concertation and consultation with society is likely to lead to denial and backlash, especially with an 87.9% of a non-mastery of the science of climate change by media practitioners in Bamenda. This opposition in modern times is very clear as information relating to climate change is usually from scientists and journalists who more often than not utilize complex scientific language in disseminating the information. Ward and Menezes (2008) highlighted the disgruntlement echoed by scientists who attended a workshop on climate change communication:

... climate scientists were frustrated by what they saw as a failure of the general public to understand and appreciate the seriousness of the climate change issue. Many scientists said they were frustrated that the accumulated advances in the understanding of climate change over more than two decades of research had not led to a better-informed public...

It is therefore important that messages should be shaped and tailored in ways that the lay community people will easily understand;

thus, reducing the possible eventuality of resistance. It is commendable to scale down climate services and information so that individuals at the community level may easily interpret and relate to the messages and information being conveyed. This is so because community members trust their knowledge more than they do scientific knowledge which they perceive to be too complicated. The media in Bamenda seemed to be following this integrated approach, though it should be noted that the messaging is still very much leaning towards disseminating mostly scientific messages and programs of climate change.

5. CONCLUSION

Climate variability and change in Bamenda has been marked by decreasing rainfall and increasing temperatures. The media has been communicating this variability and change through daily weather forecasts, climate-specific programs, use of social media and raising public awareness of the necessity of introducing climate change education in schools. This has been plagued by a poor mastery of the science of climate change by media practitioners, inadequate slots, poor coverage and inadequate personnel. There is room for improvement as it is seen that only a few media outlets are engaged in climate and environmental-related activities apart from the mainstream writeups and productions. This, however, should act as an incentive to challenge these media organs, personnel and other stakeholders to adopt a more integrated approach in their stance towards climate change and other environmental-related programs and activities. From the general results of this research, the following endorsements can be taken to better strengthen the role of media in climate change communication:

- The media should intensify the production, broadcast and publishing of content related to climate change.
- The media should go further than climate change content creation and dissemination and engage also in activities related to better conserving the environment.
- Key organizations and the state should partnership and support the media organs more on climate change issues.

- There should be more focus on climate change impacts and responses rather than on the causes.
- Technical jargon should be subbed for local and simple language that can be understood by everyone to stamp out misinterpretation.

FUNDING

This research paper received no internal or external funding

ORCID

Suiven John Paul Tume  <https://orcid.org/0000-0002-2159-4608>

REFERENCES

- Arneth**, A., Denton, F., Agus, F., Elbehri, A., Erb, K., Elasha, O. B., Rahimi, M., Rounsevell, M., Spence, A., & Valentini, R. (2019). Framing and Context. *Climate Change and Land, an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. Cambridge University Press, 79-130.
- Barik**, N., & Karforma, S. (2012). Risks and Remedies In E-Learning System. *International Journal of Network Security & Its Applications (IJNSA)*, 4(1), 51-59.
- Blanchard**, E, Razaki, R., & Frasson C. (2005). Cross-Cultural Adaptation of e-Learning Contents: a Methodology. *International Conference on E-Learning. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, (1), 1895-1902.
- Chirisa**, I., Matamanda, A.R., & Mutambwa, J. (2018). Targeting Audiences as Important Game Changers in the Climate Change Communication Push: Examples and Cases. In Tume, S.J.P., & Tanyanyiwa, V.I., (Eds.), (2018): *Climate Change Perception and Changing Agents in Africa & South Asia*. Vernon Press. Wilmington, Delaware, 117-132.
- Filho**, W.L., Azeiteiro, U., Manolas, E., Azul, A.M. & Azeiteiro, U. (Eds.), (2018). *Handbook of Climate Change Communication, Volume 2: Practice of Climate Change Communication*. Springer, Cham, 47-60.

-
- Intergovernmental** Panel on Climate Change-IPCC, (2019). Climate Change and Land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems, IPCC, 1-77.
- Intergovernmental** Panel on Climate Change-IPCC, (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, 41.
- Moser, S.C.**, (2010). Communicating Climate Change: History, Challenges, Process and Future Directions. *WIREs Climate Change*, 1, 31–53.
- Tani, B.V.**, & Tume, S.J.P., (2019). The role of municipal councils in climate change mitigation the Northwest Region of Cameroon. *International Journal of Resource and Environmental Management*, 4(2), 3-17.
- Tanyanyiwa, V.**, & Madobi, R. (2018). It Takes Two to Tango: Potentials and Actual use of Weather and Climate Information for Decision-Making in Zimbabwe. In Tume, S.J.P., & Tanyanyiwa, V.I., (Eds.), (2018): *Climate Change Perception and Changing Agents in Africa & South Asia*. Vernon Press. Wilmington, Delaware, 55-76.
- Trenberth, K.E.**, Jones, P.D., Ambenje, P., Bojariu, R., Easterling, D., Klein, A.T, Parker, D., Rahimzadeh, F., Renwick, J.A., Rusticucci, M., Soden B., & Zhai, P., (2007). Observations: Surface and Atmospheric Climate Change. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D., Qin, M., Manning, Z., Chen, M., Marquis, K.B., Averyt, M., Tignor, H.L., Miller, (Eds. 2007)]. Cambridge University Press, Cambridge, United Kingdom & New York, NY, USA, 232-336.
- Tume, S.J.P.** (2021). Impact of Climate Change on Domestic Water Accessibility in Bamenda III Sub- Division. *Journal of the Cameroon Academy of Sciences*, 17(2), 131-145.

-
- Tume, S.J.P., & Kimengsi, J.N.** (2021). Indigenous and modern agro-based climate adaptation practices in rural Cameroon. *International Journal of Environmental Studies*, 78(4), 1-10.
- Tume, S.J.P., Kongnso, M.E., Nyukighan, M.B., Dindze, N.E., Njodzeka, G.N.** (2018). Stakeholders in Climate Change Communication in the Northwest Region of Cameroon. In Tume, S.J.P., & Tanyanyiwa, V.I., (Eds.), (2018): *Climate Change Perception and Changing Agents in Africa & South Asia*. Vernon Press. Wilmington, Delaware. 97-116.
- Tume, S.J.P., Mbilam, S.J., Ndze, A.N, Ngoran, D.N., Lawong, J.Y. & Njodzeka, G.N.** (2018). Role of the Media in Climate Change Communication in the Northwest Region of Cameroon. In Filho, W.L., Azeiteiro, U., Manolas, E., Azul, A.M. & Azeiteiro, U. (Eds.), (2018): *Handbook of Climate Change Communication, Volume 2: Practice of Climate Change Communication*. Springer, Cham, 47-60.
- United Nations Framework Convention on Climate Change-UNFCCC,** (2006). UNFCCC Handbook. UNFCCC Secretariat, Bonn, 216.
- Wandera, S.** (2021). Climate Change Communication: The Kenya Story. In Tume, S.J.P., & Tanyanyiwa, V.I., (Eds.), (2018): *Climate Change Perception and Changing Agents in Africa & South Asia*. Vernon Press. Wilmington, Delaware, 33-54.
- Ward, B., & Menezes, S.** (2008). Communicating on Climate Change: An Essential Resource for Journalists, Scientists and Educators. Metcalf Institute for Marine & Environmental Reporting, Narragansett, 27.