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ARTICLE

Mediating the Climate Change Message: Knowledge, Attitudes and Practices (KAP) of Media Practitioners in Ghana

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ABSTRACT

While scientific evidence on the human agency of climate change seems compelling, public conviction and capacity to adapt and adopt mitigation measures remain tentative among developing countries and poor populations. It throws into question the presumed essentiality of the media in Africa in increasing public awareness and informing local policy responses. This study pivots on the argument that in order to be effective stewards and purveyors of climate change information, media practitioners must themselves be demonstrably informed and keenly committed. To determine this the study used the KAP survey model to assess the understanding (Knowledge), predisposition (Attitude) and response (Practice) of Ghanaian journalists to reporting climate change. The findings showed high awareness, but low knowledge, high conviction but low engagement of media practitioners and institutions towards addressing the incidence and consequences of climate change. In effect, awareness and empathy are prerequisite factors, but they do not inevitably lead to knowledge and engagement in competently mediating the climate message. The lack of compelling correlations between specific attributes of KAP of climate change also raises doubts about the predictive power of individual vis-à-vis institutional loci of control in defining and driving specific subjects up the news values chain.

Keywords: Africa; climate change; communication; developing countries; Ghana; journalists; knowledge attitudes practices (KAP); media

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Introduction

The scientific evidence on climate change as caused by anthropogenic factors is increasingly compelling, although public conviction is still equivocal. This is attributed, principally, to the challenge of translating tacit awareness into concrete action on climate change (Adger, Lorenzoni, and O'Brien 2009; Naustdalslid 2011). In developing countries such as Ghana where public understanding of climate change is still flimsy, the discourse can take on metaphysical overtones. After 150 people died in a flooding disaster in Accra on June 3, 2015, the Ga Traditional Council claimed in a press conference that the floods were a manifestation of the wrath of the gods for flagrant violations of Ga traditional mores and values (Issah 2015). The traditional council exercises customary jurisdiction over Accra, the capital of Ghana. Such contentious statements were widely reported in the media, while contrary views linking perennial flooding in Accra to climate change, such as that made by Sherry Ayittey, then minister for the environment (Abotsi 2015), were underplayed.

The literature suggests that evidence and effects of climate change are particularly manifest within developing countries and among poor communities where rising sea tides and searing heatwaves most directly impact on lives and livelihoods (IPCC 2007; Naustdalslid 2011; World Bank 2014). Developing countries and poor populations are however the least aware and least able to adapt or adopt mitigation measures at the societal, political and personal levels (Collier, Conway, and Venables 2008; IPCC 2007). In spite of this dilemma, there persists in Ghana and much of Africa a dearth of indigenous research evidence on the agency of media in increasing public awareness and informing local policy responses (Baird 2008). So while, for example, the Ghana National Climate Change Policy (GNCCP) (GoG 2012) has included information, communication and education (ICE) as one of seven systemic pillars of policy action, there is no coherent media advocacy strategy to address climate change in the country.

Yet the media, as drivers of social change, have a big role to play in raising public consciousness of the reality and importance of climate change, including its peculiar manifestations and particular consequences for different ecological populations (Meribe 2017; Moser and Dilling 2007; Weber 2010). Research conducted by the BBC World Service Trust to gauge public understanding of climate change in Ghana found that together with schools, the media were the main source of information on climate change (BBC WST 2010). Public understanding was, however, low because there was poor communication on climate change through the media or other means. The report concluded that "the intensive media coverage and public awareness campaigns prevalent in much of the industrial world have been largely absent in Africa, particularly outside the urban centres" (BBC WST 2010, 3).

This paper is based on the argument that in order to be effective stewards and purveyors of climate change information, media practitioners must themselves be demonstrably well informed and keenly committed. A survey of 1,218 Americans by Bord, O'Connor

and Fisher (2000) showed knowledge of the causes of climate change to be the strongest single predictor of stated behavioural intent. As agents of social change, if media practitioners are uninformed or disinterested in issues of climate change, it would be difficult for the public, who rely on the media, to know about scientific developments that point to the need for mitigation and adaptation responses. Much of the information and knowledge people could gain on the threats or solutions to climate change would depend on the awareness and activism of the interlocutors (journalists, editors, producers) whose work it is to process and present such information to the public. The paper, therefore, explored the perceptions and practices of media workers in covering climate change as an existential concern. It interrogated the central role of the media professional as source and resource for climate change information. The objective was to establish empirical evidence on influences on the gatekeeping decisions and behaviours of journalists, and their knowledge, attitudes and practices on climate change mitigation and adaptation. Specifically, the study sought to answer the following research questions:

1. What are the levels of awareness and knowledge of climate change among media practitioners in Ghana?
2. What are the attitudes and value orientations of media practitioners in Ghana towards climate change as a subject of journalistic interest and attention?
3. To what extent are respondents' backgrounds and locations related to their treatment of climate change news?

Global Perspectives on Media and Climate Change

There is a growing body of scholarly interest in the role of the media in creating public interest and informed response to climate change. It includes some notable European and North American research addressing factors within the news production-consumption circuit (Boykoff 2011; Carvalho 2010; Olausson 2009; Ryghaug and Skjølsvold 2016). The literature interrogates also the role of the media in constructing public opinion and inspiring behaviour change (Olausson 2011; Weber 2010), and the advocacy potential of the media to frame the climate change debate and influence policies (Happer and Philo 2013; Nisbet 2010). These studies, conducted mostly in the global North, have highlighted the media's increasing importance in helping to communicate climate change messages and creating public awareness and responsiveness to its adverse effects (Bacon 2013; Boykoff 2011; Painter 2013; Olausson 2009; 2011).

The media are one of the key public arenas within which social issues are framed and provide the lens through which audiences—including development brokers and policy actors—are able to visualise the world outside and form the pictures in their heads (Lippmann 1998). They are able, thereby, to set the agenda of public discussion and secure the necessary political commitment for policy decision and action, including action on the issue of climate change. As Bacon (2013, 4) points out:

> The role of media in a democracy is to truthfully report contemporary events and issues to the public. This includes scientific evidence about the crucial issue of climate change. If people are confused or ignorant about potential threats, they cannot be expected to support action to confront them.

Bacon (2013) argues that there are few media stories of more obvious public interest than that of climate change, which according to scientists threatens the lives, security and livelihoods of millions of people and whole species. The coverage and quality of the coverage of climate change issues in the media, however, vary widely across the globe. In a study interrogating dominant discourses on climate change and commitments to environmental sustainability Midttun et al. (2015) identified differences in media content among developed, developing and under-developed countries represented, respectively, by Norway, China and Ghana. While reportage in the Norway (rich West) media highlighted the moral and pragmatic responsibilities of developed countries in exporting climate action, coverage in the China (emerging East) media emphasised national political and policy responses such as energy efficiency and clean technologies deployment. In contrast, an analysis of the content of newspapers in Ghana (developing South) revealed that stories were heavily attributed to international sources, and were not necessarily reflective of local experiences of the manifestations and consequences of climate change. This may well be a reflection of the capacity or constraints of Ghanaian journalists, whether as producers of enterprise stories or as source reporters of local climate change news.

Among the factors that are thought to govern the media content production chain, structural factors within and outside the media as an institution are often given ontological priority over the journalist as an individual. Consequently, most of the studies that relate to climate change communication and information flow and which address the role of the media, have tended to focus on the institutional level and neglected to document the presence and spread of attitudes among media practitioners (Altmeppen 2008). From a sociological point of view, however, it is arguable that what is referred to as the news production culture is a product of individual attitudes and influences. Media practitioners individually play particular and important surveillance roles in keeping an eye on the public sphere and alerting the public to issues of public interest or concern. They are the metaphorical bridge between policy actors, duty bearers and the public. Thus if they recognise their central role in responding to climate change they will more eagerly and competently contribute to policy and behaviour change efforts to mitigate its incidence and effects. Yet research has not adequately interrogated the attitudes of journalists, including what they know or think about climate change as a subject of news treatment.

In their well-received text on the sociology of media content, Shoemaker and Reese (2014) suggest that while there are "multiple forces that simultaneously impinge on media" (2014, 1) the personal idiosyncrasies of the individual journalist are no less

important. This is because not only do their personal biases inevitably affect their news accounts but also "journalists of a particular leaning often self-select into organizations because of their pre-existing policies, history, and organizational culture" (2). They cite and discuss such demographic and psychographic influencers as age and work experience, education and social status, personal attitudes, values and beliefs, professional roles and ethical convictions. The arguments they make provide a useful anchor for conceptualising the factors that influence the journalist as a mediator of climate change messaging.

The Constitution of Ghana (1992) and a number of consequential legislations (National Media Commission Act 1993 [NMC Act 449]; National Communications Authority Act 1996 [NCA Act 524], 2008 [NCA Act 769]; Electronic Communications Act 2008 [Act 775]) have been auspicious for media development in the country. The enabling environment thus created de-monopolised the regime of state controls and produced a plethora of print and broadcast media, together with a burgeoning digital and online media sphere. Industry statistics indicate more than 1,010 active print media registered with the NMC, including at least 11 regular dailies (GoG 2017). In addition, more than 400 radio stations and 75 television stations have been authorised by the NCA, the body responsible for granting broadcast frequencies (NCA 2017). Added to these are technological developments that have led to an increase in access of Ghanaians to Internet and social media platforms. It is also noteworthy that the Ghanaian media landscape is among the most liberal and vibrant on the continent. According to the 2017 World Press Freedom Index, published by the advocacy group Reporters Without Borders (RSF), Ghana ranked 26th out of 180 countries in the world—notably ahead of such more "mature democracies" as France (39), UK (40) and US (41). All of these factors should enable opportunities for the inclusion of a diversity of themes and topics for media coverage, including the subject of climate change. A key concern, however, has been a political economy of the media in which the drivers of news are not value-neutral. The media have been polarised along political lines, resulting in partisan considerations, more than individual journalistic norms or institutional cultures, determining what makes the news (Tietaah 2015). What this suggests is that beyond the individual level factors (such as professional orientation) and institutional level forces (such as the marketplace) as adduced by Shoemaker and Reese (2014), there are important macro-level political imperatives that may mitigate the interest and capacity of the media and practitioners in Ghana to contribute to public knowledge and action on climate change.

The corollary consequence would be to undermine the capacity of the media to contribute to national development efforts. Since the UN Stockholm Conference on the Human Environment in 1972 and, 20 years later, the Rio Conference on Environment and Development in 1992, there has been global consensus on the existential links between the environment and development. As an agrarian society, the challenges posed by climate change to Ghana's national development efforts are even more compelling (BBC WST 2010; IPCC 2007; World Bank 2014). While this realisation has produced

progressive regulatory and policy responses, such as the Environmental Protection Agency (EPA) Act, 1994 (Act 490) and the Ghana National Climate Change Policy (GNCCP) (GoG 2012), a lack of comprehensive media and communication strategy to mainstream public awareness and action could lessen the prospects of climate compatible development.

Methodological Considerations

The knowledge-attitude-practice (KAP) survey model provided useful constructs around which to explore the orientation of Ghanaian journalists in relation to climate change. The KAP model offers a framework for determining the awareness and understanding (knowledge), feelings or predispositions (attitude) and response or behaviour (practice) of people towards an issue or subject matter. As is argued in this paper, media practitioners can only be expected to respond to climate change as a subject for journalistic treatment if they know the issues and understand their agency in promoting mitigation and adaptation recommendations. At the same time, knowledge per se would not necessarily inspire journalistic attention and action. Ojomo, Elliott, Amjad and Bartram (2015) emphasise this rider when they echo a number of studies (including Lorenzoni and Pidgeon 2006; Naustdalslid 2011; Stehr and Grundmann 2012) in noting that knowledge is a necessary but insufficient condition of climate action. Attitudes must be disposed towards the issue salience and news worthiness of climate change; knowledge and attitude are then expressed in practice, specifically, in the incidence and nature of climate change coverage by media practitioners.

The KAP survey instrument was adopted for the study because its properties and processes enable the researcher to identify the prevailing knowledge levels and gaps, preconceptions and experiences, and behavioural intentions and practices of respondents. It therefore provided the basis for finding out what media practitioners in Ghana knew or thought about climate change as caused by human activity, about their role and responsiveness to climate change coverage, and about their own behaviour and practices in seeking and sharing information for promoting awareness creation, mitigation and adaptation efforts.

The study focused on media practitioners operating within four clusters of ecological regions in Ghana defined to be differently impacted by anthropogenic factors. These include the following: Accra, representing the urban region; Sunyani, representing the forest belt; Keta, representing the coastal zone; and Tamale, representing the savannah region. Mainly because these clusters also represent different ethnographic experiences it was expected that the proximity of respondents to, and encounters with, peculiar ecological experiences would constitute sufficient grounds for their particular and distinct journalistic attention and treatment.

Data was collected using a pre-tested, 55-item, self-administered questionnaire. The knowledge items contained questions about respondents' awareness of, and understanding about, the causes and manifestations of climate change, and about the common concepts, policies and protocols within the climate change literature and discourse. The attitude questions pertained to their convictions about climate change as caused by human factors, the extent to which it represents a threat to national development, and the extent to which they were interested in, and believed that they could personally contribute to, its mitigation. The practice questions elicited responses about whether, or how often, they treated climate change subjects, as well as the extent to which the gatekeeping practices of their institutions supported their production and presentation of climate change news and issues. The three variables were quantified mostly on a five-point Likert-type scale, requiring respondents to indicate the strength of their disposition or conviction on each of the key KAP variables, although there were also a few open-ended follow-up items, and yes/no/don't know options.

Respondents were deemed to be knowledgeable, or to have positive attitudes or engagement on climate change if the majority of their responses indicated "very much"/"very major" or "much"/"major" on the respective question, or if their responses to the relevant questions produced a mean value equal to or more than four on the five-point scale. For purposes of dichotomous comparisons, mean values less than four (or the parallel percentage scores attributed to the responses "very little"/"very minimal," "little"/"minor" and "not sure"/"indifferent") were interpreted as reflecting low measures on the relevant KAP variable. To find out the possible association of practitioners' position (as editor, reporter, producer, presenter) with their KAP on climate change, a Pearson product-moment correlation coefficient test was conducted.

Questionnaires were distributed to 200 respondents through a cross-sectional, nonrandomised, sampling process. The sample distribution was as follows: 40 respondents each were drawn from Sunyani, Keta, and Tamale. Twice the sample for each of these regions was used for Accra (i.e., 80), primarily because of the preponderance of media and journalists in the national capital. Within each ecological region, the maximum variation technique was then employed to ensure inclusion of the different actors (i.e. reporters, editors, producers, presenters, managers) and sectors (i.e. public and private press, and public, commercial and community radio and television) of the media industry and landscape. A total of 160 usable questionnaires, representing an 80 per cent response rate, were retrieved and validated.

Findings

Demographic Profile of Respondents

Up to 57 per cent (91) of the respondents identified themselves as reporters; more than one in seven (15.6%, 25) were editors; six per cent (10) identified their primary

responsibility as producers; another eight per cent (13) said they were presenters; one in 20 (8) identified themselves in other roles designated collectively as media managers. Also included in the sample was one student intern who sometimes covered news assignments. The remaining 12 respondents did not indicate their designations/positions within their media organisations.

Along with the designation or position of the respondent within their institutional structures, the age and years of work experience as well as levels of (professional) educational attainment are important to an understanding of their journalistic capacity and disposition towards issue advocacy generally and climate change reporting particularly. The age profile of respondents was presumed to provide insights for understanding, broadly, the climate change convictions and information seeking practices of respondents across generational lines. Three in five (59.4%) of them were between 25 and 34 years old. They gave a high mean rating of 4.22 (SD 1.013) on their conviction of climate change as caused by human factors. Those between 35 and 44 years constituted 18 per cent, with an even higher mean rating of 4.36 (SD 1.036). Those between 18 and 24 constituted 13 per cent, and their rating on the conviction of climate change as caused by human factors was a more modest 3.69 (SD 1.251). Only two respondents fell within the age bracket of 55–64 years, and they gave a rating of 4.00 (SD 1.4.4) on their conviction of climate change as caused by human factors. It would appear, then, that age did not remarkably distinguish respondents in terms of their convictions about climate change as caused by human factors.

In terms of years of journalism practise, two in five (42.2%) had worked as media practitioners for less than five years, and the mean score on their conviction about anthropogenic causes of climate change was 3.98. A third of them (34%) said they had been in media practice for between five and 10 years. These were notably more strongly persuaded about the human agency of climate change (mean=4.47 on 5-point scale). Three in 20 had been engaged in journalistic work for between 11 and 15 years; they gave a mean rating of 4.17 (SD 1.114) on climate change as caused by human factors. Six individuals (3.8%) had worked for between 16 and 20 years; they rated the contribution of human factors to climate change at 3.75 (SD 1.893). Five of them had worked in the capacity for more than 20 years; the strength of their conviction was relatively more modest at 3.50 on the 5-point scale (SD 1.915).

In terms of formal education, close to 92 per cent (*N*=146) of the respondents had a minimum of college education. The remaining 8 per cent had some education up to the secondary level. Furthermore, the majority (114, 71.3%) indicated they had received professional/formal training from journalism/communication institutions. Specifically, close to half of them (49.3%, *N*=150) held journalism diploma certificates. They gave a high mean rating (4.38, SD 0.792) on the human agency of climate change. Twenty-seven respondents (18%) held journalism graduate degrees. Their mean rating on the human causes of climate change was 4.08 (SD 1.248). Only 11 individuals (7.3%) held

postgraduate degrees in journalism; their rating of the human factors of climate change was high at 4.36 on the 5-point scale (SD 1.286). Of the remaining 38 who answered the question, only one person had no journalism training at all. The rest (24.6%) said they had received on-the-job training. They held the least relative conviction (3.85, SD 1.258) about the human factor in climate change.

Knowledge of Climate Change

All respondents indicated some awareness of climate change particularly over the last five years, although one person suggested awareness dating back to 1978. The majority of respondents (60%, *N*=160) identified the media as their foremost source of awareness. Schools came a distant second (14%) followed closely by seminars (13%) as sources of awareness of climate change for media practitioners. Even fewer were the references to non-governmental organisations (7%), meteorological service agencies (4%), and personal observation (2%) as sources of awareness on climate change. The predominance of references to the media suggests the central role of the media and media practitioners in creating awareness and improving knowledge on the reality and response to climate change.

The vast majority (75.7%) of respondents were "very convinced" or "convinced" about climate change as caused by human factors. Less than 1 in 10 (7.5%) were "not convinced" that climate change was caused by human factors while 13.8 per cent indicated they were "not sure." Awareness and even conviction, however, did not seem to reflect in knowledge. Respondents betrayed a general lack of knowledge and understanding of the buzzwords and common discourses in the literature as well as on policy processes, events and issues about climate change. The means the percentage scores for the "yes," "no," and "don't know"/"not sure" responses were 39.9 per cent, 40.6 per cent and 19.6 per cent respectively. Notably, only about two in five respondents indicated they knew the term green agenda. Even fewer (fewer than 2 in 6) knew what green growth meant. Among those who professed some understanding of key climate change issues, their responses to the follow-up probes were often tenuous or only partially correct. For example, in answer to a question on what they knew about Ghana's climate change policy, 66.7 per cent (*N*=156) admitted that they had no knowledge at all. Those who said they knew something about Ghana's climate change policy mentioned indicative but fragmented answers, including the Forestry Commission's tree planting agenda, the ban on the importation of used fridges, the campaign to switch from incandescent light bulbs to compact fluorescent light (CFL) or LED bulbs, a reduction of greenhouse gas emissions (such as carbon dioxide [CO_2] and Hydrofluorocarbons [HFCs]), and the ban on the export of (rosewood) timber. The answers proffered did not include any of the five policy areas in the National Climate Change Policy (NCCP) document: Agriculture and Food Security, Disaster Preparedness and Response, Natural Resource Management, Equitable Social Development, and Energy, Industrial and Infrastructural Development.

Similarly, 66.3 per cent of the respondents (*N*=156) indicated a lack of knowledge on any international conferences, conventions or protocols on climate change. Those who said they knew identified a number of common examples, including the United Nations Framework Convention on Climate Change (UNFCCC), the International Conference on Climate Change (ICCC), the Intergovernmental Panel on Climate Change (IPCC), the Kyoto Protocol, the Warsaw Climate Change Conference, and the Conference of the Parties (COP). A few examples were, however, tentative at best, such as a so-called South African protocol, the Rio+20 Conference, Tokyo protocols, and the Manhattan declaration.

Table 1: Descriptive statistics on causes of climate change in community

Factors contributing to climate change	*N* 1 *f* (%)	**Response** 2 *f* (%)	3 *f* (%)	4 *f* (%)	5 *f* (%)		*M*
Bush burning	**158**						**4.18**
Urban		2 (02.9)	4 (05.8)	14 (20.3)	17 (24.6)	32 (46.4)	4.06
Forest		3 (07.5)	1 (02.5)	7 (17.5)	13 (32.5)	16 (40.0)	3.97
Savannah		0 (00.0)	0 (00.0)	2 (06.9)	4 (13.8)	23 (79.3)	4.72
Coastal		1 (05.0)	2 (10.0)	3 (15.0)	5 (25.0)	9 (45.0)	3.95
Logging/ deforestation	**157**						**4.33**
Urban		2 (02.9)	1 (01.4)	8 (11.6)	18 (26.1)	40 (58.0)	4.35
Forest		0 (00.0)	1 (02.6)	5 (13.2)	9 (23.7)	23 (60.5)	4.46
Savannah		0 (00.0)	0 (00.0)	2 (06.9)	7 (24.1)	20 (69.0)	4.62
Coastal		1 (04.8)	1 (04.8)	5 (23.8)	4 (19.0)	10 (47.6)	3.89
Polluting water bodies	**157**						**3.86**
Urban		2 (02.9)	3 (04.3)	19 (27.5)	17 (24.6)	28 (40.6)	3.96
Forest		0 (00.0)	6 (15.8)	5 (13.2)	14 (36.8)	13 (34.2)	3.89
Savannah		0 (00.0)	4 (15.8)	8 (27.6)	10 (34.5)	7 (24.1)	3.69
Coastal		1 (04.8)	4 (13.8)	3 (14.3)	4 (19.0)	9 (42.9)	3.89
Air pollution	**155**						**4.05**
Urban		3 (04.3)	1 (01.4)	8 (11.6)	18 (26.1)	39 (56.5)	4.29
Forest		2 (05.4)	1 (02.7)	9 (24.3)	12 (32.4)	13 (35.1)	3.89
Savannah		1 (03.4)	1 (03.4)	4 (13.8)	10 (34.5)	13 (44.8)	4.14
Coastal		1 (05.0)	2 (10.0)	4 (20.0)	4 (20.0)	9 (45.0)	3.89

1=very little; 2=little; 3=not sure; 4=much; 5=very much; *N*=valid responses; *M*=means

Irrespective of the ecological peculiarity of their region of operation, there was consensus in the aggregates of sentiments among media practitioners about the factors contributing to climate change. As indicated in Table 1, on average, seven in 10 respondents were affirmative (mean=4.10 on 5-point scale) in their knowledge that "bush burning,"

"logging/deforestation," "polluting water bodies" and "air pollution" all contribute to climate change. Beyond this general picture there was also an observable tendency for respondents within particular ecological communities to be relatively more certain about the contribution made to climate change by factors local to their environment. Respondents within the forest zone felt more positively about the contribution of logging/deforestation to climate change (mean=4.46) than either bush burning (3.97) or the pollution of water bodies (3.89) or air pollution (3.89). Likewise, respondents within the savannah zone were more aware of bush burning (4.72) than logging/deforestation (4.62), air pollution (4.12), and the pollution of water bodies (3.69). Respondents from the urban cluster responded positively to the contribution of logging/deforestation (4.35), air pollution (4.29) and bush burning (4.06), but were less affirmative about the pollution of water bodies (3.96). The notable exception to these inherent distinctions was in the case of the coastal zone cluster. They were relatively uniform in their attribution of the identified anthropogenic factors: bush burning (mean=3.95), logging/deforestation (mean=3.89), the pollution of water bodies (3.89), and air pollution (3.98); and they demonstrated the least aggregate awareness (3.91) of the human agency of climate change. The proportion of respondents who were "not sure" that any of the identified human-induced factors contributed to climate change is also notable considering that as media workers, it would be reasonable to expect them to be relatively better informed than the average member of the larger Ghanaian population.

Across the different ecological zones, respondents had a high mean awareness (4.18) of the contribution of bush burning to climate change. This is reflected in 75 per cent of respondents who considered that bush burning contributed "much" or "very much" to climate change. In relative terms, however, perceptions of the level of threat posed by bush burning were more restrained among respondents in the urban, coastal and forest communities. In each of these communities, less than 50 per cent of the respondents thought bush burning was "very much" a threat to climate change. Significantly, however, more than 79 per cent of respondents from the savannah zone identified bush burning as contributing "very much" to climate change. When the means are compared, it is noteworthy that respondents within the savannah zone were more definitive (mean=4.72) than respondents within the coastal belt (mean=3.95) about the contribution of bush burning to climate change. Also noteworthy is that none of the respondents within the savannah regions indicated that bush burning contributed "very little" or even "little" to climate change compared to the other regions where some respondents chose those options.

There was a high aggregate degree of conviction among respondents about the contribution of logging/deforestation to climate change. More than four in five (83.4%) said logging/deforestation contributed "much" or "very much" to climate change. This translates to a high aggregate level of knowledge (mean=4.33) about logging/deforestation as a factor in climate change. The relative high mean values among savannah (4.62) and forest (4.46) respondents on the one hand, and on the other

hand the low awareness among coastal respondents (3.89) suggest some association between local ecological experiences and knowledge of logging/deforestation as a cause of climate change.

Relative to the other human-induced factors, respondents were least likely (mean=3.86) to identify the pollution of water bodies as a factor in climate change. A total of 65 per cent of respondents thought that polluting water bodies contributed "much" or "very much" to climate change, with more than a third (35.6%) describing this effect as "very much." The percentage of respondents who indicated that they were "not sure" that water pollution contributed to climate change was relatively high (22.3%), compared to the percentages who were uncertain about bush burning (16.5%), logging/deforestation (12.7%) and air pollution (16%).

Respondents showed higher aggregate awareness (mean=4.05) of the contribution of air pollution to climate change than they did to the pollution of water bodies. In terms of relative means, media practitioners from the urban and savannah clusters demonstrated more knowledge (mean scores of 4.29 and 4.14, respectively) about the contribution of air pollution to climate change compared to those within the forest and coastal clusters, each of which groups recorded a mean value of 3.89. More than three in four (76.1%) respondents said air pollution contributed "much" or "very much" to climate change, with close to half (47.7%) of them saying air pollution contributed "very much" to climate change. Another 15 per cent thought air pollution contributed "little" or even "very little" to climate change (compared to 5.7% of urban respondents, 8.1% of forest respondents, and 6.8% of savannah respondents). As many as one in every five (20%) of them were "not sure" that air pollution contributed to climate change, although on this response there was a greater sense of doubt among forest region respondents (24%).

Attitudes toward Climate Change

Respondents were asked to indicate the extent to which they considered climate change as a threat to their community and national development, and as a global issue worth covering by the media. Four in five respondents (79.7%) thought climate change was a "major threat" (32%) and even a "very major threat" (47.7%) to community development, and therefore needs journalistic attention. They felt even more strongly about climate change as a threat to national development: 86.9 per cent of the respondents recognised climate change as a "major threat" (32.7%) or "very major threat" (54.2%) to national development. Not only did they consider climate change as a threat to local and national development, but eight in 10 of them (80.9 %) were also positive about climate change as a global issue worth media attention and treatment.

At the other end of the scale, less than one in 10 (8.5%) considered climate change a "minimal threat" (6.5%) or even a "very minimal threat" (2.0%) to the development of their community. At the national level, even fewer (5.9%) considered climate change a

"minimal" (2.6%) or "very minimal" (3.3%) threat. Similarly, less than one in 10 (7.7%) were subdued about climate change as a global issue worth covering. Their responses to the open question about the reasons for their answer were indicative of the key reasons why they considered climate change newsworthy and may be grouped under the following six categories of responses: food production/food security, deforestation, flooding, silting of water bodies, pollution of water bodies, and exposure to ultra-violet rays.

Table 2: Descriptive statistics on effects of climate change on life and livelihood

Observable manifestation	N	Response					M
		1 *f* (%)	2 *f* (%)	3 *f* (%)	4 *f* (%)	5 *f* (%)	
Food security	152	20 (13.2)	6 (3.9)	27 (17.8)	36 (23.7)	63 (41.4)	3.63
Flooding	156	7 (4.5)	11 (7.1)	16 (10.3)	38 (24.4)	84 (53.8)	4.24
Extreme weather	156	4 (2.6)	9 (5.8)	13 (8.3)	36 (23.1)	94 (60.3)	4.33
Depletion of natural resources	156	3 (1.9)	9 (5.8)	30 (19.2)	35 (22.4)	79 (50.6)	4.09
Resource conflict	152	13 (8.6)	14 (9.2)	28 (18.4)	50 (32.9)	47 (30.9)	3.75
Loss of livelihood	155	7 (4.5)	12 (7.7)	26 (16.8)	39 (25.2)	71 (45.8)	4.05
Human health/ disease	155	6 (3.9)	9 (5.8)	24 (15.5)	42 (27.1)	74 (47.7)	3.63
Endangered wildlife	156	4 (2.6)	7 (4.5)	23 (14.7)	43 (27.6)	79 (50.6)	4.20
1=very little; 2=little; 3=not sure; 4=much; 5=very much; *N*=valid responses; *M*=means							

Beyond the triggering factors affecting climate change, the study also sought to find out the extent of perceived or felt effects and consequences of climate change on life and livelihood. Respondents held weak convictions about the impact of climate change on food security (mean=3.63), conflict over natural resources (mean=3.75), and human health/disease (mean=3.63). Conversely, they held strong convictions about the impact of climate change on flooding (mean=4.24), extreme weather (mean=4.33), depletion of natural resources (mean=4.09), loss of livelihoods (4.05), and endangered wildlife (mean=4.20). More than three in five (65.1%) respondents said climate change contributed "much" or "very much" to food security, with more than two in five (41.4%) saying climate change contributed "very much" to food security. On the other hand, close to one in six (17.1%) said climate change contributed "little"/"very little" to food security. A similar proportion (17.8%) were "not sure" that problems of food security were the result of climate change.

Close to four in five (78.2%) respondents said climate change contributed "much" or "very much" to flooding, with more than half (53.8%) saying it contributed "very much." More than four in five (83.4%) said climate change contributed "much" or "very

much" to extreme weather, with three in five respondents (60.3%) saying that climate change contributed "very much." More than seven in 10 (73%) indicated climate change contributed "much" or "very much" to the depletion of natural resources while less than one in 10 (7.7%) said climate change contributed "little" or "very little." Nearly one in five were unsure about the contribution of climate change to the depletion of natural resources. Close to four in five (78.2%) thought climate change contributed "much" or "very much" to endangering wildlife, with one in two (50.6%) saying that climate change contributed "very much" to that outcome. Only about 7.4 per cent indicated that climate change played "little" or "very little" role in endangering wildlife. More than three in five respondents (63.8%) said climate change contributed "much" or "very much" to conflicts over natural resources. Less than one in five (17.8%), however, said climate change contributed "little" or "very little," and slightly more (18.4%) indicated they were unsure. More than seven in 10 (71%) respondents said climate change contributed "much" or "very much" to loss of livelihoods, with more than two in five (45.8%) saying that the contribution to loss of livelihoods was "very much." More than one in 10 (12.2%), however, thought climate change contributed "little" or "very little" to loss of livelihoods. Climate change was also identified as having serious effects on human health by more than seven in 10 (74.8%) respondents. As many as 15.5 per cent indicated they were "not sure" about the link between climate change and disease/ill health.

Respondents were asked to indicate the extent to which they thought the government, the media and NGOs could respectively contribute to address climate change issues. A majority of respondents was positive (mean=4.00) about the role of the government in addressing climate change. Three in four (74%) had great faith in the ability of the government to contribute to addressing climate change issues, of which nearly two in five (58, 37.4 %) indicated that the government could contribute "very much," and a similar number (57, 36.8%) indicated that the government could contribute "much" to addressing climate change. About one in 10 respondents (10.4%) had little faith in the responsibility of the government to contribute to addressing climate change issues. Another 15.5 per cent were unsure of the government's responsibility or ability to address climate change. In answer to the follow-up question on how the government could contribute to addressing climate change issues, respondents identified five main categories of possible intervention:

1. designing legal frameworks and policies on climate change;
2. providing resources;
3. providing leadership by educating the general public;
4. mainstreaming climate change issues in the national agenda; and
5. providing research opportunities to investigate further into climate change issues in the country.

Relative to the two other agencies (government and media) respondents were least assured (mean=3.56) about NGOs' responsibility for addressing the issues of climate change. More than a third (34.8%) of them indicated they were "not sure" of the responsibility and ability of NGOs to contribute to addressing climate change issues. In addition, close to one in 10 (9.7%) thought NGOs could contribute only "little" or "very little" to mitigating the incidences or consequences of climate change. A little over a third (35.5%) thought NGOs could contribute "much" and one in five (20%) indicated that they could contribute "very much" to addressing climate change. Respondents identified three main ways by which NGOs could contribute to addressing climate change issues: influencing public policy, providing public education to communities and groups on climate change through workshops and seminars, and helping to build the capacity of journalists to educate the public.

Finally, respondents were more positive about the responsibility and contribution of media institutions towards addressing climate change than both the government and NGOs. Far more of them thought the media could contribute "very much" to addressing climate change (46.5%) compared to the government (37.4%) and NGOs (20%). Furthermore, they were less unsure about the role of the media (18.5%) than they were about the role of NGOs (34.8%), although they were also less sure about the media than they were about the government (15.5%). Less than one in 10 said they believed that the media could contribute "little" or "very little" to addressing the challenges of climate change. They were almost unanimous in their judgement on the power of the media to create awareness on climate change principally through their gatekeeping and agenda-setting activities. An overwhelming majority (93.8%) said the media could influence attitudes towards climate change and only four (2.5%) respondents said the media could not influence such attitudes, while another two (1.3%) were not sure. They explained that the media were effective in disseminating information on climate change because of public trust in scientific facts conveyed by the media. Nearly two in three (65.7%) respondents said their stories aimed at changing behaviour. And while more than three in four (75.1%) of the respondents said the media could create awareness, they were less sure about the media's ability to influence policy; less than half of them (45%) said the media could influence policy.

Respondents were positive (answering "very much" and "much") about the potential of radio, television and the Internet for addressing climate change. They were negative (answering "very little" and "little" or "not sure") about newspapers and interpersonal channels for promoting mitigation and adaptation messages. Respondents thought highly of radio (83.6%, *N*=153) and even more so of television (84.3%, *N*=153) as means of addressing climate change. A more modest majority (52.2%) thought the Internet could be used to address climate change. On the other hand, they thought less of newspapers (61.9%, *N*=155) and even interpersonal or non-mass media methods (61.7%, *N*=149) as channels for promoting mitigation and adaptation strategies.

Practices on Climate Change Coverage

While respondents affirmed the potential of the media to address climate change, there was considerable doubt about their current contribution as change agents. An overwhelming majority (77.5%) felt the media were not doing enough to influence attitudes on climate change. The main reason respondents gave for this observation is that the media are more interested in political stories and events. Other reasons include the lack of information by the media to be able to make the desired contribution to discussions on climate change.

Beyond the institutional agency of their media organisations, respondents were asked about their personal interest in seeking information on, and contributing to public understanding of, climate change. The majority of them indicated they could personally contribute "very much" (31.8%) or "much" (30.5%) to public education on climate change. Surprisingly, 29.2 per cent (*N*=154) were ambivalent, declaring themselves "not sure," while 5.8 per cent thought they could personally contribute "little" and fewer still (2.6%) said they could contribute "very little." Furthermore, close to half (47%) of the respondents were "very interested" in seeking information on climate change. About another quarter (22.5%) were "interested" in seeking such information. This adds up to nearly seven in 10 who would be desirous of information on climate change. Only one in 20 (5%) and less than one in 10 (8%) were, respectively, "not interested" or "little interested" in seeking such information. The remaining 15.6 per cent were indifferent. They suggested that they could be more effective in addressing climate change if they attended workshops and seminars and engaged experts on the subject.

Respondents were asked to indicate whether their media positively encouraged or provided institutional support for coverage of climate change issues. Most respondents (84.1%; *N*=145) said their news organisations encouraged stories on climate change. Only 6.2 per cent indicated their organisations did not directly encourage such coverage. The remaining 9.7 per cent were uncertain or thought their media were ambivalent about the public interest or the expectation from them to promote positively public awareness on climate change.

Furthermore, while nearly 77.9 per cent (*N*=149) of respondents said their news organisations had done stories on climate change, 8.7 per cent said their news organisations had not done stories on climate change before, and the remaining 13.4 per cent were unsure if their media had done such stories. Those whose media had done climate change stories mentioned examples relating to bush fires, logging, illegal saw-chain operations, sand mining, sea erosion of coastal lands and even gold mining. Specific stories they could recall included stories on women and the climate, the launching of a climate change book for Africa, and the launching of a guidebook on reporting climate change for journalists.

At the individual or personal level, 56.6 per cent (*N*=145) of respondents had done stories on climate change; the remaining 43.4 per cent had either not done any stories

or could not immediately recall if they had. Those respondents who had done stories before explained that they had done between one and 30 event-driven stories on climate change. Fewer had done enterprise-driven stories on climate change. Importantly, among those who had done stories on climate change, only 5.2 per cent said their stories had ever been unpublished/rejected by their organisations. Rather, as many as 84.3 per cent said that their stories had never been rejected, suggesting that there was probably no editorial gatekeeping aversion to doing climate change stories. Just about 1 in 10 (10.4%) were not sure/could not remember if their stories had been rejected.

Analyses and Implications of Findings

In general, these findings show high awareness, but low knowledge on climate change issues by Ghanaian media practitioners. They also indicate high conviction, but low engagement of media practitioners and their institutions towards addressing the incidence and consequences of climate change. This observation echoes what Naustdalslid (2011) has referred to as "a knowledge-action paradox" (248). In the developing country context, the deferred human-induced manifestations of climate change may well be the opportunity cost of meeting basic survival needs. This is not to suggest that climate change action is not a concern among journalists. Rather, the presumed relation of climate conviction to effective stewardship is borne out by the observed tendency for media practitioners to express greater empathy with and identification of specific human-induced causal factors within the ecological zone in which they operated than with factors relatively removed from their direct acquaintance. This suggests that particular personal encounters or experiences with peculiar manifestations of climate change were instrumental in media practitioners' convictions about anthropogenic causes of climate change. It resonates with the finding by Ojomo et al. (2015) that respondents in the Southern Nigerian states of Akwa Ibom and Lagos tended to know more about climate change effects that were particular to their locales and lived experiences than effects relatively further removed from their direct, personal acquaintance.

The findings demonstrate also that while awareness, conviction and empathy are prerequisites, these factors do not inevitably lead to knowledge and engagement in competently mediating the climate change message. Again, this is consistent with literature (Naustdalslid 2011; Ojomo et al. 2015; Stehr and Grundmann 2012)

As noted earlier, some respondents failed to express clearly an understanding of the most common climate change issues, concepts and buzzwords. This evident lack of familiarity with the common climate change terms, policies and conferences among media practitioners is remarkable. It suggests a need for the scientific community and climate change advocacy agencies in Ghana to review how they engage with and support media practitioners in spreading the right climate messages.

Journalists and other media practitioners are themselves already conscious of their shortcomings. When asked about their capacity-building training needs they generally admitted to a lack of basic knowledge of climate change as a subject matter, including international conventions and protocols and Ghana's policies on climate change. They also indicated that they lacked the technical skills, and their organisations lacked the logistical capacity, to enable the full use of ICTs and Internet resources to improve their work in promoting climate change mitigation and adaptation efforts. More than three-quarters said they had not attended any capacity-building event on climate change, and only 24 per cent had ever attended a climate change workshop, seminar or conference.

A particular objective of the study was to find out if/how the climate change engagement (practices) of media practitioners was related to their background (position), understanding (knowledge) or conviction (attitude) about the anthropogenic causes of climate change. Accordingly, four specific statistical tests were run to find out the capacity and motivation of media practitioners to mediate (practice) the climate change message.

First, to determine the relationship between respondents' newsroom position/designation and knowledge on climate change, a Pearson correlation test was run. Weak, negative correlations of no statistical significance were found in four knowledge areas: their understanding of the term "Green Agenda" ($r = -.102$, $n = 141$, $p = .227$), whether there is a difference between climate change and global warming ($r = -.068$, $n = 140$, $p = .424$), if they had ever heard of the IPCC ($r = -.082$, $n = 116$, $p = .383$), and what climate change conventions/protocols they knew about ($r = -.182$, $n = 82$, $p = .101$). Two weak, positive correlations of no statistical significance were found in two other knowledge areas: their understanding of the term "green growth" ($r= .107$, $n= 139$, $p= .210$) and what they already know about Ghana's climate change policy ($r= .106$, $n= 84$, $p= .337$). Correlation is significant at the 0.05 level (2 tailed) or 0.01 level (2 tailed). The total effect of this is that there was no significant correlation between a person's position and their knowledge on climate change. The correlations observed, therefore, may just have happened due to chance.

Second, to determine the relationship between respondents' knowledge of and attitude toward climate change, a Pearson correlation test was run. Weak, negative correlations of no statistical significance were found in one attitude area: whether NGOs can contribute to addressing climate change issues ($r= -.159$, $n= 145$, $p= .055$). Three weak, positive correlations of no statistical significance were also found in three attitude areas: whether government could contribute to address climate change issues ($r= .094$, $n= 145$, $p= .260$), whether the media could contribute to address climate change issues ($r= .094$, $n= 147$, $p= .257$), and climate change as a threat to national development ($r= .079$, $n= 148$, $p= .340$). Correlation is significant at the 0.01 level (2 tailed). This indicates that there was no significant correlation between a person's position and their attitude towards climate change. The correlations observed may just have happened by chance.

Third, a Pearson correlation test was run to find out the relation between practitioners' knowledge and their practice on climate change. Weak, negative correlations of no statistical significance were found in three practice areas: whether they had personally ever done any stories on climate change (r= -.113, n= 136, p= .190), particular skills/strengths needed in doing climate change stories (r= -.061, n= 10, p= .867), and whether any of their stories on climate change had been rejected by their news organisation (r= -.014, n= 126, p= .876). Three weak, positive correlations of no statistical significance were found in three practice areas: whether they had recently attended any climate change workshop, seminar, conference or other capacity-building meeting (r= .017, n= 147, p= .841), particular skills/strengths they had in doing climate change stories (r= .084, n= 73, p= .477), and particular skills/strengths they lacked/needed in doing climate change stories (r= .014, n= 81, p= .900). Correlation is significant at the 0.05 level (2 tailed) or 0.01 level (2 tailed). In effect, cumulatively, there was no significant correlation between a person's position and their practices on climate change, therefore, the correlations observed just happened by chance.

Finally, to determine the relationship between respondents' attitudes and practices on climate change, a Pearson product-moment correlation was tested. Weak, negative correlations of no statistical significance were found in five practice areas: whether their news organisation ever did any stories on climate change (r= -.175, n= 146, p= .034), if their news organisation encouraged stories on climate change (r= -.146, n= 143, p= .081), if they had personally ever done any stories on climate change (r= -.138, n= 144, p= .098), what particular skills/strengths they lacked/needed in doing climate change stories (r= -.134, n= 88, p= .219), and what strengths (technical, logistic) their organisation had in doing climate change stories (r= -.111, n= 66, p= .377). Besides, a weak, positive correlation of no statistical significance was found between their attitude and one practice question, namely, whether any stories by them on climate change had been rejected by their news organisation (r= .002, n= 133, p= .982).

The demonstrated lack of compelling correlations between specific attributes of KAP of climate change among media practitioners is revealing. They provoke epistemological and heuristic questions about the presumed predictive power of individual vis-à-vis institutional loci of control, in defining and driving specific subjects up the news values chain. According to the KAP model, it is possible to perceive and predict behavioural intent by examining an individual's cognitive and attitudinal cues. In other words, high knowledge and positive disposition towards climate change are correlated, and are, in turn, predicted to determine the likelihood that an individual will engage in climate change news and information production and distribution. It would seem with respect to media practice, however, that the pertinence of personal judgements and convictions about what to include or prioritise and what to exclude or downplay among the competing currents of news events and issues are not ultimately determinant. Rather, the findings support the idea that news decisions are a product of multiple institutional drivers of media agenda, such as the prevailing political economy of climate change reporting

(Meribe 2017), that tend to trump the individual locus of control on what makes the news (Shoemaker and Reese 2014). Related to this dynamic is the idea that the KAP model is probably more suited to subjects that promise or entail individual behaviour change benefits. A presumably non-excludable subject like climate change mitigation/adaptation would require broader policy incentives to inspire individual/institutional activism. This is what inspired the policy recommendation at the Rio Summit in 1992 for a cross-, inter-, and trans-disciplinary mainstreaming of climate change (UNCED 1992). While the merits of this call are granted, a corps of dedicated beat or enterprise climate change practitioners and media, trained and supported to advocate the cause, will seem more promising than relying on normative news routines. These propositions are not whimsical. They resonate with the nested factors of news decision-making that Shoemaker and Reese (2014) canvas in their sociology of media production.

Policymakers, scientists and NGOs interested in discovering more effective ways of partnering with the media in improving the flow of information and communication on climate change in local communities as well as increasing their education, advocacy and communication campaigns may find these findings useful. Training and capacity-building efforts must also be variable, to respond to the peculiar information needs and climate change effects that media practitioners experience and report across their respective ecological zones of experience and operation.

This study was inspired by the observation that not as much research attention has been paid to factors that influence the actions of journalists as individuals (such as their awareness and attitudes), as has been given to the institutional-level drivers of media production and presentation (such as the regulations, sources, technologies and financing). While the findings of this study have sought to fill this research gap, a number of questions are still outstanding. What role, if any, do such factors as news routines and beats, gatekeeping and deadlines, gender and society, play in informing and forming the knowledge and engagement of journalists on climate change issues? Is there a difference in the influences on individual journalistic perceptions and practices based on differences in media ownership types and content distribution platforms? In what ways do extra-media factors within the news and information value chain (political and policy actors, public relations and advertising agents) affect the interests of the individual journalist in climate change reporting? These questions expose the limitations of this study. Further research is required to address these questions.

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