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Communicating Climate Change, A Sustainability Challenge: An Analytical Field Study

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Abstract

The Climate change is a globally recognized phenomenon. Climate change communication is envisioned to play an important role in sensitizing publics in different countries across the world of climate change and the ways to address, adapt and mitigate it.

This study aims at unpacking the extent to which media and communication in Egypt contribute to climate change communication through enhancing the level of climate perception, knowledge, and awareness of the public in Egypt. The research, therefore, is focused on unraveling how different groups of people in Egypt, based on their life experiences and media exposure, describe their perception of the challenges of climate change, its impact, and how they perceive climate change communication and its challenges.

Keywords: Communicating, Climate Change, Sustainability.

Introduction:

Climate change is a global reality. Temperatures are rising to unprecedented levels, and climate on earth is increasingly heating. Countries across the world are experiencing the repercussions of the changing climate that are deeply disturbing to its people's normal life and livelihoods patterns. To address global environmental issues, including climate change, the Sustainable Development Goals (SDGs) are developed and planned to be reached by 2030. Climate change communication is envisioned to play an important role in sensitizing publics in different countries across the world of climate change and the ways to address, adapt and mitigate it.

Meanwhile, the common understanding that climate change is a distant phenomenon that has minimal personal relevance to members of the public, is a challenge to climate change communication, and that climate issues will not necessarily affect countries in the near future is another compounding factor.

This study aims at unpacking the extent to which media and communication in Egypt contribute to climate change communication through enhancing the level of climate perception, knowledge, and awareness of the public in Egypt. The research, therefore, is focused on unraveling how different groups of people in Egypt, based on their life experiences and media exposure, describe their



perception of the challenges of climate change, its impact, and how they perceive climate change communication and its challenges.

The study is based on the spiral of silence theory (Noelle-Neumann, 1974) and uses the issue attention cycle and the media attention models (Downs, 1972) to guide the study.

Problem Statement:

One of the main functions of the media is informing and educating society. Thus, it is anticipated that the media play an influential role in raising the public's awareness and enhancing their knowledge about the major sustainability challenges including climate change and its consequences.

The study proposes that the global presence of a spiral of silence in global media regarding climate change issues is reflected in local media, in many countries including Egypt. This hinders coverage of the science of climate change and climate change issues, resulting in an inadequate provision of information and knowledge and preventing the development of a climate knowledgeable and a climate change literate public.

The study also proposes that the punctuated media attention to climate change and its issues is another indicator of the silence spiral, which adds to the complexity of the issues relevant to climate change communication. In other words, the study proposes that coupled with the media induced spiral of silence, the media reports on climate change only when the need arises to provide coverage of international climate events, or severe climate change incidents, and that media attention fades when the events and incidents are outdated. Climate change, however, is a constant reality and continual attention and coverage of its science and issues is necessary to raise the awareness of the public of its urgency.

While this situation can be due to the media's fear of causing public anxiety and stirring public fear, it nonetheless obstructs the creation of an enabling environment that can provide the space and the factors that create climate knowledgeable publics. An important contribution this study will make is that it will glean an understanding of the complex situation of punctuated media attention to climate change in the context of a media induced spiral of silence.

Focusing the sample on members of the public who are aware of climate change through various means, this study will be gleaning whether participants in the sample have been sensitized through media content, or through other means. Probing deeper into the perspectives of the sample participants, the study provides a cursory indication on how climate change communication is viewed, and how it can be enhanced and improved in Egypt.

Importance of the study:

Climate change communication has emerged as an important topic due to the severity of the problems related to climate change and the calamity it poses to humanity. This study adds local perspectives from Egypt to the climate change communication literature and helps fill a gap of knowledge about local perspectives. which represents an important addition to the literature and adds to the importance of the study.

Additionally, the study presents an important contribution that helps fill the gap in the literature relevant to a phenomenon that can be described as the media induced silence about the topic of climate change. In accordance with the SDGs, all countries urgently need to uptake climate action in order to mitigate and combat the looming dangers of a changing climate. Climate action requires climate change communication as an essential prerequisite, which has not yet picked up with the intensity and speed required to counter a problem with the magnitude of global climate change. This study will contribute to deepening the understanding of how the climate change knowledge, awareness and perception is handled by the media, from the perspective of the public in the context of a media induced silence around the issue.

Moreover, the importance of this study stems from the urgency of climate change as a globally threatening phenomenon and its impact on Egypt. The impacts of climate change on Egypt, as a developing country on a path to economic progress, can hinder the development efforts that the country is working very hard to achieve. The study results will contribute to the application of new ideas and practices in the field of climate change communication which responds to the necessity of informing and educating the local public in order to take part in climate action,

Objectives of the study:

The main goal of this study is: To glean whether media and various means of communication in Egypt are responding to the urgent need to educate, engage and sensitize the public about climate change, from the public's perspective.

This main goal is broken down into the objectives of the research are:

- Determine the role and patterns of media coverage of climate change issues from the public's perspective.
- Understand the public's perception of climate change communication based on their exposure to the different media.
- Understand how the public perceives media framing of climate change.
- Determine the public's patterns of engagement in interpersonal communication about climate change.



Research Questions:

The main research question of this study is: **How does the public in Egypt perceive the media's climate change communication, its role and patterns?** This research question is broken down into the following sub-research questions:

- What are the main sources of the public's information and knowledge about climate change and its issues?
- What are the main messages formulated by the media in disseminating climate change information from the public's perspective?
- What are the patterns of media coverage of climate change and its issues from the public's perspective?
- Do members of the public engage in interpersonal communication regarding climate change and its issues? (as part of the spiral of silence) (climate action)

Research Methodology and Design:

The study utilized a qualitative research design, and data was collected through semi-structured, in-depth interviews with people residing in different governorates in Egypt. To obtain the sample needed for the purpose of the study, familiarity with climate change issues was the main criterion for sample selection. The sample comprised educated males and females living in Egypt, who possess a level of knowledge and awareness of climate change, and belong to the age group 20 to 49 years old.

Through semi-structured, in-depth interviews (IDIs) with individuals who have some level of knowledge, awareness and / or experience with climate change and its effects, the study aims at gauging their perception of the role the media and means of communication played in their acquired knowledge about climate change.

This study used a qualitative research design, where semi-structured, in-depth interviews (IDIs) were conducted with individuals who are knowledgeable about, and familiar with climate change. Using a snowball sampling technique, individuals who fit the sampling criteria from different governorates in Egypt were interviewed.

Research Design:

This study delves into the role of media in various aspects of climate change communication, including enhancing the public's awareness of climate change, creating the enabling environment for their ability to engage in climate change communication, and reflecting the importance of the climate change issue in Egypt. It aims to glean whether and how people who are familiar with climate

change and its relevant issues can recognize and describe the role of the media in their acquisition of climate knowledge and awareness, as well as their ability to engage in interpersonal communication about climate change.

Participants in the semi-structured, in-depth interviews answered questions related to their own experience learning about climate change – how they gained information, what they learned about climate change, and whether the media they use played a role in this learning process. Participants were also asked about their opinion regarding the factors that they think or believe affect the ability of the media to focus on coverage of climate change and its issues. Using a snowball technique, data was collected from regular citizens, who have prior climate change knowledge, and who reside in different governorates in Egypt.

Study Population and Sample:

The study population comprises members of the public who have prior knowledge about climate change through a variety of means. The study population is, therefore, hard to locate as the number of the public who know climate change issues is unidentified. Recruiting people having no prior knowledge of climate change would have obstructed the achievement of the aims and the objectives of the study. Thus, knowledge of climate change is identified as a main selection criterion to ensure that participants are able to gauge the effect of the media, if any, on their level of knowledge of climate change.

A purposive, snowball sampling strategy is employed in this study, as it is the sampling strategy most suited to the goal and purpose of the study. As a purposive, convenience sampling strategy, it allows for involving initial informants who fit the specific criteria for selection of the sample with utmost precision from the social network of the researcher. Through these initial informants, who are often called the seeds of the sample, more respondents who fit the sampling criteria are selected. Referrals to more respondents are then asked from each of the respondents recruited until sample saturation is reached.

Through the researcher's social network, a sampling chain / tree was developed, starting with five initial informants, who then referred 2 to 3 respondents each. New respondents were asked to make two to three referrals each, and so on, until the point of saturation of the sample was reached. Two factors were indicative of the point of saturation of the sample: exhausting the number of potential respondents who fit the sampling criteria within the extended social network, and reaching the sample size needed. The final sample size was less than anticipated, however, due to excluding some interviews from the sample after conducting them.

Some of the interviews conducted with referrals were excluded from the study during the stage of data analysis. Some were from the group of



respondents who experienced climate induced incidents and were too emotional to provide clear and meaningful answers to the interview questions. Other excluded interviews were with some of the group of respondents who know about climate change through their hobbies and environmental interests, but were not able to express their viewpoints about the role or patterns of media coverage, or climate change communication.

The snowball sampling technique is criticized for being respondent driven, which can be biased and overly selective (Navarrete, Adrian & Bachelet, 2022), and for lack of external validity, generalizability and representativeness (Parker, Scott & Geddes, 2019). However, the purposive snowball sampling technique is selected for this study since it is notably effective in capturing samples comprising hard to reach populations (Faugier, & Sargeant, 1997), and in capturing samples that are information rich (Patton, 1990; Nyimbili & Nyimbili, 2024). A sufficient sample of people who have basic knowledge and awareness of climate change and climate literacy can be quite hard to reach, hence the choice of a purposive snowball sample was the best and most appropriate kind of sample to use given the topic being studied.

Sample selection criteria:

Through a purposive snowballing sampling strategy, the participants in the study were selected. The main criterion for selection is prior knowledge of climate change and its issues, regardless of where or how this learning was gained.

The main criteria for selection and inclusion in the sample, therefore, are: people residing in Egypt, with a level of knowledge and awareness of climate change, belonging to the age group that ranges from 20 to 49 years old, and to have basic literacy and can read so as not to eliminate any type of media. In accordance with the selection criteria, the initial participants were identified through the researcher's social networks and were asked to participate in a semi-structured, in-depth interview (IDI) after explaining the aim of the study. These participants served as seeds to the larger sample as they were asked to recommend others with the same characteristics, according to the sample criteria.

Sample characteristics: A purposive snowball sample was selected to conduct 60 IDIs with individuals from the public in Egypt in the age range of 20 to 49 years. The final sample recruited comprised 54 participants, ranging in age from 20 to 49. The sample reached was broken down into three age groups: 20 to 29, 30 to 39, and 40 to 49 years. Participants were 19, 18, and 17 participants in each age category comprising a balanced number of male and female participants.

Data was collected from the final sample comprised individuals living in different governorates in Egypt mainly Cairo, Alexandria, Sohag, and Minya.

The sample participants gained their climate change knowledge in different ways which were later categorized into: work, traditional and social media, and experience with events and incidents centered on climate change.

Respondents who experienced climate induced experiences were mostly from governorates that witnessed such incidents. The study participants were selected through snowball sampling, not by location nor by specifying certain governorates. The sample started with initial informants (seeds) in Cairo and Alexandria, and referrals led to sample participants from Sohag and Minya.

Table 1: Sample characteristics

Main source of climate change information	Age Group			Gender		Governorate			
	20 – 29	30 – 39	40 – 49	Male	Female	Cairo	Alex	Minya	Sohag
Media exposure	6	6	6	7	11	3	3	3	3
Work	5	4	4	8	7	3	3	5	5
Experience	5	5	4	8	6	2	5	5	5
Interest / Hobbies	3	3	3	4	3	3	3	2	1
	19	18	17	27	27	12	13	15	14

The main source of information identified by the sample were: media exposure, work, experience, and hobbies. The sources of information about climate change mentioned by the participants are not mutually exclusive and can be overlapping in some cases. For example, a participant can identify work as the main source of learning, and mention media as another secondary source. Basic literacy is one of the criteria for sample selection so as not to purposefully exclude any means of communication (i.e. newspapers, magazines, websites, flyers, social media, etc.). The education level of the sample included participants who had completed basic education, vocational education, and university graduates. The sample comprised employed males and females from different governorates in Egypt.

Research Instruments & Data Collection: The IDI guides were prepared and pilot tested prior to the data collection phase. The time spent conducting each interview ranged from half an hour to one hour. Data analysis was done manually.

Validity, Trustworthiness and Credibility: Several measures were taken by the researcher to ensure validity and credibility of the research and reduce bias. The sample was initially formed through initial informants (seeds) who are trusted by the researcher and they, in turn, know and trust their referrals. Another measure was member checking which entailed checking the



information received from respondents against information received from other cases in the same locations or governorates. For example, respondents from governorates comprised general public and people working at NGOs or government entities. Cross checking the information received from the different respondents was pursued to ensure validity of the data.

Negative case analysis is another method followed by the researcher to ensure validity. Some of the respondents reflected viewpoints and ideas rather contradictory to the general overall themes expressed by most of the respondents. The data pertaining to these cases were analyzed and included in the data analysis and reporting of findings.

Theoretical Framework:

This study seeks to gauge the role of the media in enhancing the public's awareness of climate change, in response to the dire need to address the SDG 13 – climate action to combat climate change. There are high hopes that the media would play a role in elevating the awareness of the public of climate change and its issues, as well as motivate the public to adopt climate friendly behaviors and actions. The research uses the spiral of silence theory (Noelle-Neumann, 1974), the issue attention cycle and the media attention model (Downs, 1972) to guide the study.

The spiral of silence theory: The main idea of the theory revolves around the individual's need for acceptance by people in his / her environs. Due to this need for acceptance by others in the community, people would exercise control over their opinion if inconsistent with the opinion of the majority, in fear of isolation by the rest of society (Noelle-Neumann, 1991).

According to the theory, people assess the acceptability of an opinion through scanning the environment and checking the climate of opinion. This is readily revealed through the mass media and the topics and opinions the media covers. It is also through the agenda setting function of the mass media that people can determine which topics are acceptable to discuss in public with others (Noelle-Neumann, 1974; Salmon & Kline, 1983). The agenda setting function of the mass media entails its ability to direct the attention of the audience to certain topics through continual propagation (McCombs & Shaw, 1972), and the ability to direct the attention of the audience away from other topics by limited to no propagation of these topics. Hence, the spiral of silence theory is linked to the agenda setting theory of mass media through reflecting the two extremes of influencing the public's knowledge and attention.

Research on the effect of the recent technological advances and the ensuing digitalization of the media on the influence of the spiral of silence in society was inconclusive (Hakobyan, 2020), despite the optimism that social media would dissolve the dynamics of the spiral of silence.

The spiral of silence and public opinion: The spiral of silence theory addresses important questions regarding the role and function of the media in

society: is the media a creator of public opinion, or a propagator of an existing public opinion? Does the role of the media entail creation of public opinion or reflection and propagation of an existing public opinion? Does the media mold or mirror public opinion? The answer provided by this theory is that the role of the media is to create public opinion, through its ability to influence society. This happens through the media's ability to provide pressure in the surrounding environment regarding a given topic to which people feel pressured to respond. This response can either be acceptance, silence or enthusiasm (Noelle-Neumann, 1974). Later research findings, however, suggested that most people's opinions are more influenced with interpersonal relationships than with media messages (Salmon & Kline, 1983), which adds an additional layer of specificity to the ideas of the theory.

The climate spiral of silence: While a spiral of silence can be created around any topic in society, researchers have observed it specifically in the field of climate change, and called it the climate spiral of silence (Mailbach et al, 2016; Geiger & Swim, 2016; Heald, 2017). It denotes the phenomenon implicit in the process of spiraling the silence around climate change in society. The less people hear others discuss climate change, the less motivated they become to discuss it themselves, as it seems to them that it is socially unacceptable. The silence among people about a certain topic is a reflection of the media's silence and reflects the silencing effect of the media. This silencing effect ultimately results in a vicious circle of silence about important topics that matter to society (Noelle-Neumann, 1993).

By applying this logic to the situation of public opinion concerning climate change in most countries, it can be deduced that the role of the media is glaringly missing. If the perceived function of the media in society is to create public opinion, then the lag in creating a mass of climate-knowledgeable and climate-aware public in any country can be arguably attributed to the media's inability to provide the enabling social environment for climate relevant public opinion to be formed.

This situation possibly entails self-censorship and the limiting of interpersonal communication about climate change and its issues (Geiger & Swim, 2016; Heald, 2017), which further exacerbates and deepens the adoption of the spiral of silence spin around climate change and its related issues. It can, therefore, be argued that as a result of this, the media created a spiral of silence instead of creating a favorable environment for climate change awareness and climate literacy.

Issue Attention Cycle Model and Media Attention to Climate change:

Based on the discussion of the climate spiral of silence, an interesting question to probe into is: if the media is viewed as mostly silent about climate change, what are the explanations? This question leads to the discussion of the



linkage between the Issue Attention Cycle Model and the Media Attention Cycle.

Media attention to specific topics is proposed to be linked to an issue attention cycle of the public. The surge in public attention that maybe given to a specific issue at certain points in time is explained by the issue attention cycle (Downs, 1972). The dynamics of this process are summarized in a number of phases starting with the pre-problem phase, which is when the issue is known only to a few experts, not to the general public. Then the alarmed discovery and euphoric enthusiasm phase, which is when the general public gets interested in the issue and gives it sudden increased attention, coupled with the belief that the issue can be easily resolved. When the public realizes that the solution is more complicated than previously believed to be and that a significant cost will be incurred to solve the issue reflects the third phase, followed with the fourth phase when a gradual decline of public interest starts happening. The final phase is the post problem phase which is a much lower level of attention than the second phase, but higher than the pre-problem phase (Downs, 1972).

Although the attention to the issue subsides, but the general awareness of the issue among the members of the public gets higher than the pre-problem phase (Downs, 1972), awaiting another chance to gain increased attention again. The importance of the role of the media in this model is crucial. The level of attention of the media to an issue will affect the rise and fall of the public attention to this issue. Hence, issues that receive consistent and persistent coverage from the media, are the ones that remain at the focus of public attention (Downs, 1972).

Media Framing:

Framing is one of the core concepts in media and communication studies. It is mainly the selection of certain aspects of an issue or topic and repeatedly signaling these aspects out for the audience's attention. These communication frames affect the way the audience thinks about that issue or topic (Stecula, & Merkley, 2019). It sends strategically selected messages about the issue or topic at hand that purposefully emphasizes certain aspects or factors of the topic over others, hence influencing how the audience perceives this particular topic or issue. Known as the framing effect, this process results in critical consequences related to attention given to different issues (Cann & Jett, 2020).

Review of literature:

Climate change is a scientifically evidenced phenomenon (Hansen, 2008; Adamo et al, 2021; M Majedul Islam, 2022). While the climate can change naturally over the years, anthropogenic climate change, which can be attributed to human activity (Pielke Jr, 2004), is problematic and needs to be addressed. Studies revealed that anthropogenic climate change has reached what can be called the tipping points, which trigger reaction from the natural climate change system causing even more climate change in the undesired direction (Hansen, 2008).

Climate change is addressed through SDG 13, which necessitates action on the global level to address climate change and its repercussions.

Climate Change:

Climate change is the change in the climate over time that is caused by human activity. (IPCC, 2023). To mitigate the effects of climate change on the environment and society, the human induced factors that lead to this change should be addressed (Pielke Jr, 2004). Countries of the world reached a global consensus on the necessity of addressing climate change in order to be able to provide for the world's population which is expected to reach 9 to 10 billion people by the year 2050 (Shrivastava, 2018).

The importance of sensitizing people about climate change through media has been repeatedly reiterated, but evidence of its success is inconclusive. The minimal pace of progress in this regard poses questions as to what can be the challenges, and what can be the solutions in order for the media to fulfill this role.

Climate Change and the SDGs: The SDGs are 17 goals agreed upon by world nations as solutions to the threats posed by human activity towards the environment, resulting in the degradation and destruction of earth ecosystems. This situation is further compounded by considering the idea of continual economic growth and increasing consumption as a measure of economic success, which creates an endless loop of additional ecosystem degradation and destruction (Shrivastava, 2018). The SDGs aim at balancing the social, economic, and environmental dimensions of sustainable development so that development is not only measured by economic growth or social progress; it should also include environmental factors. Hence, the SDGs seek to achieve this balance between the factors related to these dimensions (Gomez-Echeverri, 2018).

Although many countries have taken steps towards addressing the SDGs, like designing policies to guide their implementation, and taking measures to implement activities that help achieve them (Shrivastava, 2018), the fulfillment of the SDGs to achieve sustainability is quite a challenging endeavor. The challenging nature of the issues addressed by the SDGs are further augmented by the effects of climate change, which can undermine all efforts to achieve the SDGs. Therefore, climate change can adversely affect the world's ability to address the SDGs and undermine the potential to fulfill them (Fuso et al, 2019).

The role of the media in bolstering people's knowledge about climate change and enhancing their climate literacy is an essential aspect of the ability to meet the challenge of sustainability. Since climate change is an underlying factor in all SDGs, any lagging behind in its addressing will result in an undesired lag in fulfilling all the SDGs.

Climate change and its effect on developing countries: Climate change is not only one of the SDGs, it is a phenomenon that underlies the success of all other

goals. It can affect the progress of development in less developed countries and is considered a threat multiplier, which can complicate and negatively affect the challenges facing humanity (Zhenmin & Espinosa, 2019). Studies show that without a solution to redress the hazards and issues of climate change, sustainable development will be an unattainable goal to LDCs (Adamo, 2021).

Based on research findings, it is postulated that climate change and its effects will obstruct the ability of developing countries to achieve most of the SDGs (Wright, Huq & Reeves, 2015; Szabo et al, 2016). Research evidence show how the effects of climate change will hamper some development goals by making them harder to achieve. One example is how climate change can affect the improvement of agricultural production that is necessary for alleviating poverty and ensuring food security (Fuso Nerini et al, 2019; Majeed & Lee, 2017; Romeu, 2021).

Moreover, the effects of climate change will bear down disproportionately on less developed countries, and will be unrelenting for the more vulnerable of the poor within these countries, including women and children (Pérez-Peña et al, 2021). Moreover, research shows that the negative repercussions of climate change might disturb the main social and economic structures, which support mental health in society. Given that developing countries will be the most affected with these repercussions, the populations of these countries will be the most affected mentally, as well as socially and economically by climate change impacts (Majeed & Lee, 2017).

Since climate change is an underlying factor in all SDGs, any lagging behind in its addressing will result in an undesired lag in fulfilling all the SDGs. Therefore, the media's role in enhancing climate change knowledge and awareness, and addressing climate change issues and impacts is part of global sustainable development planning.

Climate change in Egypt: Egypt is among countries that are highly vulnerable to climate change. It is classified as the fifth in the world in relation to the impact of climate change (Negm, 2019), and the aspects that will be affected most are: agricultural land, coastal zones and urban spaces (Froehlich & Al-Saidi, 2017). Moreover, climate change is expected to negatively affect natural resources (Negm, 2019; Conway, 1996; Strzepek et al, 2019; Omar et al, 2021), agricultural production (Kassem et al, 2019; McCarl et al., 2013; Elbasiouny et al, 2020; Abdelaal & Elsherbini, 2021; Eid et al, 2007), and food security (Abou Hadid & Hassanein, 2013; Mostafa et al, 2021).

Some of the repercussions of climate change that can be easily observed in Egypt include frequent occurrence of severe flashfloods, significant warming, rise in temperature and reduction in rainfall, especially over the past thirty years (World Bank Group, 2021). Given the reality of actual occurrences relevant to climate change in Egypt, it is very timely to gauge how media plays, or can play, the very needed and important role of elevating the public's awareness and sensitizing them.

Climate Change Communication:

Climate change communication can be defined broadly as any effort to enhance public awareness, understanding and engagement with the issue of climate change (Moser, 2010; 2016). The main three elements that are associated with effective climate change communication are access, relevance, and understandability (Yusuf & St John, 2021). Hence, ensuring that the media is used to disseminate climate relevant information are accessible to the public, creating content that creates personal relevance between various stakeholders and the issue of climate change, and formulating a clear message that can be easily understood by an array of stakeholders, are essential aspects of climate change communication.

Climate change communication is an essential aspect of ensuring public understanding of climate change issues and accepting it as a situation that has and will have repercussion on the future of all countries. To be able to do this, people should reach the conviction that human intervention is a major driver of climate change and that the ensuing / resulting anthropogenic climate change is the real problem. Moreover, climate change communication is needed to address the emerging challenge of misinformation about the science of climate change, and to generate public climate action (Ceyhan & Saribas, 2022).

Research reveals, however, that communicating climate change is challenging; that the media and various means of communication are grappling with ways to fulfill the role of promoting awareness of climate change and its relevant issues (Tavares et al, 2020).

Media coverage of, and attention to, climate change: Over decades, studies have shown that it is mainly through the messages disseminated by the media that the publics reach their understanding of science and policy. Hence, media coverage, portrayal, and even the language used to cover climate change function as translators of climate science and climate change to the public in their terms (Goodman, McNatt & Boykoff, 2022). This indicates the importance of media coverage of important and crucial topics like climate change to reach the understanding, engagement and cooperation of the publics. However, a paradox emerges when the media attention to the topics to be covered is affected by the public's interest in these topics. In other words, media attention to the topic of climate change is said to be minimal because the public's interest in climate change, in comparison to economic issues, is minimal, which negatively affects public perception (Keleg, Watson & Salheen, 2020). This, in turn, affects public understanding and engagement in addressing the issues relevant to climate change.

However, not all coverage is beneficial to enhancing awareness of climate change. A study was conducted to detect the space given to climate change deniers and revealed that this space has increased over time. By covering these climate change denier's views, the media contributes to the misleading and



counterproductive debates that are detrimental to the goals that climate change communication is seeking to achieve (Boykoff, 2013)

The decline of coverage of climate change by global legacy media that occurred in tandem with the advent of social media was considered a negative trend and a setback to efforts to address climate change. However, newspaper coverage of climate change has risen steadily between 2014 to 2021 globally, except for the time of COVID-19 when media attention was directed to this pandemic (Goodman, McNatt & Boykoff, 2022).

Media framing of climate change:

Climate change is usually framed in the media in different types of frames. Research revealed that media frames of climate change that focus on the economic costs and benefits of climate change mitigation, as well as those focusing on the uncertainties of climate change issues are not as effective as frames that focus on the current risks and dangers related to climate change (Stecula & Merkley, 2019). Other findings reveal that while this negative framing of climate change may attract the attention of the audience (Bloodhart et al, 2019; Armstrong et al, 2018), but may result in their dismissal of the message.

Solution frames that provide solutions on the local level are some of the more hopeful frames which ultimately give a feeling that something can be done about climate change (Armstrong et al, 2018). Solution framing by the media can have a more positive effect on the audience in terms of triggering hope as it summons a sense of self efficacy in the audience. Fear appeals, coupled with information and solution-oriented framing, leads to a more engaged sense of empowerment of the audience in addressing climate change (Bloodhart et al, 2019).

Research shows that media framing of climate change takes different forms based on the national context. A frame of certainty, which propagates that global warming is generated by human activity and that it is a direct cause for climate change, is used in European countries like Sweden, France, Germany. Meanwhile, a frame of uncertainty, which denies the existence of a climate change phenomenon, is used in the US (Wibeck, 2014).

Findings of another study demonstrated that European media report on climate change by using a future focused and threatening approach. This demonstrates that the media's role is counter-productive to the efforts of enhancing climate change awareness and public engagement as the way it reports on climate change contributes to public apathy and disengagement (Tavares et al, 2020).

A study conducted in Egypt examined the effectiveness of three emotional appeals: rational, hope and fear, in Facebook communication. The click rates were similar in all three appeals but other findings concerning engagement were revealed. Messages containing facts prompted engagement, in terms of shares, clicks and reactions, more than the engagement prompted by fear and hope message appeals. The study findings demonstrate that Facebook can be used as

a platform for targeted climate change communication to specific audiences, and can be used to increase awareness and encourage action (Hamelin & Halawa, 2024).

Challenges of Climate Change Communication:

Communicating climate change is a challenging task, as it necessitates dealing with different disciplines to reach the goal of instilling behaviors that are climate-friendly. Another main challenge, demonstrated through US climate change organizations, is the inability of their communicators to identify the key publics to whom the messages of climate change are to be directed (Davenport, 2014; Jun, 2011). In addition, an agreement about how to effectively communicate climate change and its issues to the public is not reached yet (Ceyhan & Saribas, 2022).

Climate change communication faces other challenges inherent in the content to be disseminated, as well as the audience to whom the messages are addressed.

Audience related challenges: Other challenges of climate change communication include the public's denial of, or indifference to, the reality of climate change and its issues, including its human induced causes, its negative consequences, and the need to mitigate it and / or adapt to it (Johnson, 2012). The lack of personal relevance by the publics is another audience related challenge to climate change communication, which denotes that climate change is considered irrelevant by the majority of the public (Devkota & Phuyal, 2018; Pong, 2021). While these challenges can thwart any efforts to engage the public and prompt individuals to climate action, these challenges can be addressed by planning communication strategies based on audience segmentation and based on deep understanding of the audience and their needs (Chadwick, 2018). Research shows that audience segmentation differs by country due to differences in the composition, interests and inclinations of the public in different contexts.

A study revealed that the public in Singapore, for example, is classified into three segments regarding their interest in climate change: either concerned, disengaged, or passive; in contrast to segments of the publics in the United States, Australia, Germany, and India. Based on these findings, audience segmentation is an effective strategy that facilitates the planning of tailored and successful climate change awareness public campaigns (Detenber et al, 2016). Besides segmentation, studies adopting multi-way communication may bring new insights to climate communication as they reflect diverse perspectives from various stakeholders (Ceyhan & Saribas, 2022).

Knowledge related challenges: The information deficit model of communication is challenging in the sense that it assumes that public's lack of knowledge, information, or scientific literacy, is the only problem the climate change communication should address (Markowitz & Guckian, 2018). Hence, the



model assumes that making more knowledge available will automatically prompt the audience to climate action. This view is challenged by other models that highlight the importance of personal traits, interests and contexts (Lewenstein & Brossard, 2006). Findings of a study conducted in Australia challenged the information deficit model and revealed that individuals who lack or confuse information and facts about climate change can still link the issues relevant to climate change to their daily lives, and their social context (Bulkeley, 2000).

Media attention and coverage of climate change in different countries:

A study was conducted to analyze the coverage of media of climate change in four **Malaysian** newspapers. A content analysis of two years of coverage was carried out and revealed that coverage on climate change improved and increased over the two years, that it was influenced by other relevant global events and that a surge in coverage occurred during global events related to climate change (Azmi et al, 2015).

In **Pakistan**, a content analysis was conducted on the coverage of four newspapers from 2010 to 2019 and revealed that the portrayal of climate change is oriented towards solutions of the climate issue. It also revealed that the issues most covered were climate change and global warming, flooding and water scarcity in Pakistan, while neglecting the other two issues: drought, agriculture and food security in Pakistan (Javed et al, 2020).

A study was conducted to identify how an Egyptian and a British newspaper cover international agreements regarding climate change. the results showed that the British newspaper focused on the issue of climate change, while the Egyptian newspaper was more focused on pollution issues more generally. The findings also revealed that the news coverage of the British newspaper of climate change is more distinguished than the Egyptian newspaper (Al Azab, Ibrahim & Hewehy, 2021).

A study conducted in Nepal, about rice farmers' adaptation practices to climate change, revealed that farmers received the needed adaptation information through radio, TV and mobile phones. They identified these means of communication as the most practical, and easiest access as they use them on a daily basis. These means of communication were not only identified as means of providing useful climate change and agro-related information, but also as support in the farmers' resilience and efforts in adapting to climate change (Devkota & Phuyal, 2018).

A study conducted to identify media attention to climate change in newspaper coverage in Australia, Germany and India over 15 years starting 1996 to 2010, concluded that the change of weather and climate characteristics are not the important drivers of media attention, which is inconsistent with many assumptions. International events and meetings are the main drivers of media attention to climate change in these countries (Schäfer, Ivanova & Schmidt, 2014).

Studies in Egypt:

Research reveals the scarcity of research on public risk perception of climate change in developing countries, despite the fact that these countries are the ones most vulnerable to the impacts of climate change. The following are some of the studies conducted in Egypt. A study conducted in Egypt to understand the public perception of climate change revealed that experiential factors were the strongest predictor of risk perception of climate change. These factors include affect, which is a person's negative or positive feelings about an issue, and experience, which is a real-life experience with the issue. Socio-cultural orientations which reflect value orientations, like personal values, values concerning the environment or altruistic values were a weak predictor of risk perception. Findings revealed that those who personally experienced floods expressed negative feelings, and that while people misunderstood climate change and its causes, they were nonetheless concerned with its consequences (Elshirbiny & Abrahamse, 2020).

A study conducted in Egypt investigated the effect of advertising of large housing development projects with its landscapes and showcased greenery on the public perception of climate and environmental changes. These advertisements depict an unrealistic image of the environment in a city like Cairo, reflecting Westernized utopias, which alienates the general public and increases the psychological distancing with environmental and climate change in the Egyptian context. Hence, thwarting efforts aiming at enhancing environmental and climate change awareness and inducing environmental and climate action (Keleg; Watson & Salheen, 2020).

Another study was conducted in Egypt to examine and identify the general knowledge and perception of climate change among Egyptians, as well as their attitudes towards mitigation issues. The findings revealed that the respondents were knowledgeable about climate change, mainly through social media and the internet which were identified as the main source of information. The study recommends that climate change information should be disseminated through different ways that have more ability to positively change the attitudes of the audience (Salem et al, 2022).

Findings of the study:

This study examined the role played by the media in climate change communication in Egypt from the perspective of a climate change knowledgeable sample. This study explored how the sample selected perceive the role the media played in their own climate change awareness, compared to other sources like work, experience and interest / hobbies. The findings were analyzed in light of the theoretical framework guiding the study: the spiral of silence theory, framing and the media attention cycle model.



Main source of information about climate change:

While categorizing the sample into groups based on how they mainly learned about climate change, none of the sample reported that they learned through education. The sample is mainly classified into four distinct groups according to the way they mostly learned about climate change: through their work, through experience, their hobbies and interests, and through the media.

There are two types of knowledge by experience found in the sample. The first is the experience of features of climate change like warmer weather spells, rain or wind during atypical months, or cold or cooler weather during the warm season. The second type of knowledge by experience is that of experiencing a severe weather incident induced by climate change like flash floods.

Participants who learned about climate change through their hobbies and interests reported that they follow the news and articles about climate change purposively in the different traditional and social media. However, they identified their hobby and their initial interest in climate change as the main driver for pursuing this information.

Participants who are familiar with climate change because of employment worked mainly in local NGOs and local government units, whose work involved informal education of various topics, including climate change, and employees in local government entities tasked with supporting the public who experience incidents induced by climate change like floods or heavy rain.

Participants who are familiar with climate change mainly through the media mentioned TV, social media, awareness raising sessions, and radio programs.

Knowledge: Climate Change versus Global Warming:

The findings reveal that almost all participants believe that they know about global warming, but many declared that they do not deeply understand climate change, regardless of the main source of knowledge identified. Participants perceive the idea of global warming as having a definitive meaning, which is easy to visualize and to think about. According to one of the male participants, global warming means that the world is heating up, is getting warmer and warmer, but the meaning of climate change is not clear, it is too vague and too broad. A female participant commented that climate change can only be understood when linked with global warming -- only then does it seem to have a clear meaning. Other participants commented that global warming is climate change – that these are not two different conditions.

A Spiral of Silence? Media Attention to Climate Change:

When discussing the role and pattern of coverage of the media of climate change and its issues, participants who know about climate change through their nature-related hobbies or because of their interest in nature and the environment, reported that they believe that the intensity of coverage of the media globally and locally are not properly reflecting the importance of climate change as a phenomenon that has such an incredible effect on Earth. One of the

observations of this group is that when compared to coverage of any other topic, it can be easily observed that media coverage of climate change is minimal and very superficial. Superficial meaning shallow coverage, not discussing the problem in depth, nor delving into the causes and consequences. Another observation is that the coverage lacks discussions of how can people act in a way that addresses climate change, and the necessity of developing programs focusing on mitigating and adapting to the consequences of climate change locally.

From the responses and opinion expressed by the majority of the respondents, confusion about the role of the media in the topic of climate change is obvious. One of the female participants, who knows of the climate change issue through the media, commended the role of the media based on a program she watched where the TV announcer aired an episode about flooding that occurred in a certain area in Egypt and urged people to give support to this area and its people. This directed people's attention to the incident, who were able to provide food, blankets, and other forms of the support to the people who suffered from the floods in this area.

Other participants who work in local NGOs or know about the climate change issues through their hobbies, had a differing opinion. Although commendable, they view this kind of programs that are often aired to call for support for places affected by incidents related to climate change provide charitable assistance, but do not educate or enhance the awareness of the audience about the issues relevant to climate change or actions of mitigation. One participant commented that this gives the feel that something was done for these people, but does not do much for the situation of climate change itself. Another opinion is that these episodes show a demonstration of what a changed climate can do, so it has a learning dimension.

Participants who work in local government entities view media, especially social media, as essential for mitigating climate change events on the local level. It is seen as a quick way to send precautionary messages about imminent floods, or winds, or extreme hot spells. They mentioned TV and radio, but mostly through social media, these messages can reach numerous citizens extremely quickly. Overall, the main role of the media, especially TV and social media, from the perspective of participants is to provide information and keep people updated with climate change information.

Interpersonal communication about climate change:

In order to determine whether the spiral of silence is fully spiraling among the public, several questions about the ability to talk about or discuss climate change issues with others in their circles or environs. Most participants reported that they can communicate about climate change issues with their families and friends, and to a lesser extent with their work colleagues and acquaintances. They also reported that the topic of climate change is increasingly being brought



up in conversations because of the many relevant features that can help strike a conversation like talking about the changing weather, or about a climate induced incident that occurred somewhere. This reflects the idea that climate change is not considered as distant as it was before.

Interestingly, the participants who reported that they engage the most in discussions about climate change are the ones who learned about it from the media. Participants who engage in work related to climate change reported that they engage in many conversations about climate change issues that it is a normal, but for them it is mainly work, not a pastime topic for conversation. Those who experienced climate induced events feel traumatized, and would refrain from bringing it up in conversations unless it was openly talked about.

Social Media:

Social media was seen as very important by most respondents. Most participants who work in local government entities and local NGOs expressed that social media is useful when the weather gets warmer and at times when there are floods or heavy rain, etc. This group reiterated that social media is very useful during events that may happen due to climate change. From their experience, they use social media to inform people of the situation and to know where are the major problems located, where are the injured, and similar important issues. It also helps them mobilize people and volunteers to perform certain tasks or go to certain places in cases of emergency.

One useful usage of social media is mentioned by respondents who experienced extreme events, like flooding. They reported that due to the inability of women to go to see doctors in the health unit or the clinics, the doctors established certain times at which they would check on the women who need to go online. They reported that this form of e-health developed as an outcome of necessity in many areas.

People who work in local NGOs and government entities reported that social media like WhatsApp and Facebook are considered the quickest means of communication to convey important information easily and quickly. Both sending and accessing information quickly in emergency situations save time and lives, facilitating rapid movement and mobilization, or imparting critical information to citizens.

Other than times of crises, they reported that the use of mobile phones, WhatsApp, and Facebook pages has a major and important role in disseminating awareness messages and alerts related to climate change and all the issues. It helps in delivering warning messages about meteorology, rain forecasts, or temperatures. One participant reported that his governorate publishes a daily weather bulletin on social media that reaches all citizens.

Media attention and coverage of climate change:

Most respondents expressed in different ways that the media in Egypt are very inconsistent in coverage or reporting about climate change and its issues.

While this finding resonates with similar findings regarding global media coverage, it is important to probe into the specific impressions of the local public in Egypt of the features of this situation. Some of the respondents expressed their viewpoint about this situation and explained that it can be due to the difficulty in understanding climate change itself. Other respondents commented that media people are not qualified to understand, promote, or discuss the issues relevant to climate change; which is so, it is difficult to expect that they report on it consistently.

Most respondents declared that the local mass media cover climate change mainly at certain times, giving an example of an international event (COP27 that was held in Sharm El Sheikh in 2022) that was covered about a week before the event, with coverage lasting for the whole duration of the event. Although this is consistent with some of the research findings – that most climate change coverage is linked with international events – participants commented that the content of the coverage was not easy to access or understand. When asked what is meant by uneasy access, participants explained that they had to look for it, they knew it was there so they looked for it. They did not come across it. These participants are the ones whose work and hobbies are the main source of knowledge about climate change.

Respondents mentioned that even when the media cover some of the crisis situations occurring locally or globally, like when floods demolish towns or heavy rain paralyzes normal life, or when temperature is extremely high or very low in contrast to the usual; coverage is focused on the incident itself as news, but rarely are linkages with the science of climate change made, or solutions proposed. Participants attributed this to the sensationalism of the media and the necessity of packaging the news in a melodramatic way that captures the audience's attention.

Risk Perception: Framing of Climate Change

The findings of the study show that climate change is reported mostly as news events, not as a situation that needs to be addressed. Due to the sporadic coverage of climate change and its linkage only with events, the media did not employ specific frames to the climate change phenomenon, except for using the fear appeal that frames climate change as a fearful phenomenon, but one that is not well defined.

The findings reveal that those who experienced an event induced by climate change – either personally or through acquaintances, family members, and/or friends – have the strongest risk perception of climate change. Participants who perceived climate change as a real risk with profound consequences were mostly from the group who personally experienced or know people who had experienced climate induced incidents. Consistent with findings from other studies in Egypt (Elshirbiny & Abrahamse, 2020), experience with flash floods was recalled by interviewees in a deeply emotional tone and was linked with



negative feelings and expression, even when they do not understand the phenomenon of climate change itself.

Participants who know about climate change from their field of work, perceived climate change as a high-risk phenomenon, but were less emotional about expressing it than those who experienced it. Participants who received their information about climate change mainly from the media were not convinced that climate change is a high-risk phenomenon, and could not relate to the risks of climate change.

Causes and effects of climate change: The potential or existing climate change effects mentioned by most participants are mostly centered around a changed weather and fluctuating temperatures, water shortages, heavy rain, loss of agricultural land, and health issues for younger children, and the elderly. Respondents linked extreme temperature fluctuations and the turbulent weather with health issues and the emergence of a virus like COVID-19, which is considered a side effect of global warming by many of the participants.

Participants who verify that the climate change phenomenon is real verify it by mentioning the warming weather (participants from Cairo) or the cooling weather (participants from Sohag and Minya). When asked about how they know that climate change is real, respondents would mention sentences like the month of October used to be the beginning of the cooler weather, and now it is warm until November. Another indication reported by most people is that the weather is getting warmer and warmer, the summer is currently unbearable. The groups who are specifically interested in the environment and nature due to their hobbies, for example, those who like fishing, report that the normal season for the availability of certain kinds of fish has changed.

Those who are interested in the environment reported that they often feel depressed and unable to think of the future as the idea that the climate is worsening and what is done about it is too little paralyzes them to think of the future. Others stated that they will not have children, since the earth will not be a good place for their children to live on, or because they do not want to hurt or consume the environment with more children,

One effect of climate change according to some of the participants is that a warmer weather will agitate women and men, and will result in short temper and violence. A small number of participants mentioned specific effects focused on the increasingly warmer weather, potential water scarcity, negative impact on agricultural lands, and the possibility of losing some delta lands and agricultural lands.

As for the causes of climate change, a participant from Sohag governorate described climate change as a result of the pollution that is consistently happening from factories and from mobile networks. He noted that it already has its effects on the area where he lives as they now have a cold weather starting September, not November as they used to.

Heavy rain was mentioned by many respondents and was described as a dreadful experience. They explained how it affects income, because it affects casual work, and how it affects schools because when the streets are muddy, their children cannot walk to school. Sometimes, the participants reported, it affects health in two ways: the children get very sick and they cannot walk them to the health unit or a doctor's clinic in the muddy streets.

Generally, familiarity with climate change among participants does not necessarily result in their ability to name actions that they should do or are doing to address climate change or its consequences. The general feel is that climate change is a vague phenomenon and it is not clear how to act upon it.

Climate change media updates:

The number of participants who reported that they follow the news or any of the media to get updated information about climate change is highest among those who experienced it firsthand. A female participant from a small town where severe flooding occurred is quite familiar with the consequences of climate change and reported that she got this information from the media. She reported that she follows any news about climate change on TV including similar floods in other countries, conferences that are held about climate change, and other reports or programs about global warming and the changing climate.

There was no preferred medium for any of the age groups to follow the news of climate change. However, there is a general preference for any medium that provides visuals like reels, videos and photographs. Reason being that climate change related incidents can be best understood when they are watched, not read about or talked about.

Conclusion:

Climate change is no longer a distant reality. It is rather a current, everyday reality which is felt on many levels in people's everyday lives. Climate change is happening and the need to educate the public about its magnitude and scale, its mitigation and adaptation, its impacts and repercussions; is pressing more than ever.

This study focused on climate change communication and how it is perceived by the public in Egypt. The study revealed that the climate spiral of silence is partially at work and that the media is not consistently reporting or giving attention to the issues of climate change.

Respondents made several recommendations to improve climate change communication efforts in Egypt. Some respondents expressed their view that climate change is not an incident with a beginning and an end. It is an ongoing phenomenon that requires continual coverage by the various media, regardless of events, and climate change induced incidents. Others linked between low coverage with the difficulty of the public to understand or anticipate how to contribute in addressing climate change mitigation in a positive way, which is

directly related to the climate action called for by the SDGs.

Respondents, mainly who work in local government entities and NGOs view the role of the media very clearly, which is to inform the public about climate change issues and update the public about what the government is doing to mitigate climate change since much effort is exerted towards climate change mitigation through clean energy and solar energy, for example. In sum, the public should be informed about all what happens related to the climate change phenomenon, the consequences of climate change and the unforeseen possibilities.

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