

Climate Change Communication in Kolkata: Applying Communication Theories to Address the Threat of Climate Change Displacement

Lisha Samuel*

Climate change communication is an emerging field that seeks to make climate change adaptation more manageable by informing the public about climate change risks and threats. Climate change communication is important in all countries; however, a developing country like India has not fully embraced its importance. This paper will focus on Kolkata, which is the fourth most vulnerable city to sea-level rise in India. It will emphasize the “double whammy” effect of physical vulnerability that Kolkata faces from sea-level rise and accelerating subsidence rates. Sociocultural dimensions will also be considered as Kolkata is the third least prepared city to adapt to climate change and is at risk of receiving climate migrants from Bangladesh and the Sundarbans. Gaps and limitations in the applicable legal frameworks for climate adaptation and climate migration at the national, state, and local levels will be reviewed. Insights from law and policy experts from South Asia on climate migration, and members of the Indian media, are included to address current legal and sociocultural implications of the challenges. The media in Kolkata is covering potential threats like sea-level rise; however, they are not emphasizing the importance of migration from these vulnerable coastal areas. The paper proposes use of agenda-setting theory and narrative paradigm from the communication field to raise awareness of and increase public commitment to this growing crisis. It also recommends strategies to strengthen media effects to enhance climate communication regarding the risk of forced migration.

Introduction

- I. Climate Change Communication
- II. Climate Change Vulnerabilities in Kolkata
 - A. *Physical Threats*
 - B. *The Sundarbans*
 - C. *Migration*
- III. Existing Legal Framework on Climate Change and Climate Migration
 - A. *India’s National Laws and Policies*
 - B. *State and Local Laws and Policies*
- IV. Gaps in Climate Change Communication in India
- V. Communication Theories to Improve Climate Change Communication in Kolkata
 - A. *Agenda-Setting Theory*
 - B. *Narrative Paradigm*
 - C. *Strengthening Media Effects*

Conclusion

* B.A., University of Connecticut, 2018.; M.A. in Communication, Monmouth University, December 2020. This research project was funded by Monmouth’s Urban Coast Institute and supervised by Professor Randall S. Abate. The author gratefully acknowledges valuable input from Dr. Stellina Jolly, Dr. Deepa Badrinarayana, Dr. Michael Phillips-Anderson, Dr. Mahesh Menon, Dr. Golam Mathbor, Amali Tower, Krishnendu Kuntak, Jayanta Basu, Chandrima Bhattacharya, and Achinthei Vithanage, LL.M.

Introduction

Climate change communication is an emerging field that addresses how educating and mobilizing the public on the climate change crisis can promote awareness of this imminent challenge. According to the Yale Program on Climate Change Communication, the perceived threat that climate change poses is shaped by the different perspectives and underlying values and worldviews of the public. Communication should be considered a two-way process in which the message is sent and the receiver receives the message and transcribes it; however, communication is much more complex than this simple model. The basic goal of communicating climate change is to develop ways in which the information can be presented to the public and address effective strategies to help the public respond to the threat of climate change (Yale Program on Climate Change Communication).

Climate change is “a complex, persuasive, and uncertain phenomenon that people find difficult to understand, conceptualize, and relate to” (Ballantyne, 2016, p. 330). Despite growing global awareness that climate change represents a profound threat to the health and well-being of human and nonhuman species (Maibach, Roser-Renouf & Leiserowitz, 2008), the contrast between developed and developing countries on climate change awareness is striking. In North America, Europe, and Japan, more than 90 percent of the public is aware of climate change; whereas in many developing countries relatively few are aware of the issue, although many report having observed changes in local weather patterns (Leiserowitz & Howe, 2015). A developing economy like India might see the repercussions of climate change with a magnified perspective because of the potential havoc that climate change can wreak on India’s poor population and natural resources, and the threat it poses to its economic development (Mittal, 2012, p. 227).

India has the highest level of disaster displacements in South Asia and consistently one of the highest in the world (Internal displacement monitoring center). Over the next 40 years, India will experience one of the most dramatic settlement transitions in history, as its urban population grows from about 300 million to more than 700 million (Revi, 2007, p. 208). Current governance structures and the institutional culture of most cities are inadequate to address the challenge of climate change adaptation and mitigation (Revi, 2007, p. 222).

This paper will discuss the importance of climate change communication in Kolkata, India. It addresses how sea-level rise and flooding is increasing in Kolkata and the importance of developing effective strategies to raise awareness of climate-induced migration. Part I of the paper addresses the background of climate change communication and why it is important to create public awareness. Part II examines the current physical threats in Kolkata, including sea-level rise and flooding, the vulnerability of the Sundarbans, and the looming challenge of climate migration. Part III reviews the applicable legal frameworks in India at the national, state, and local levels on climate change adaptation and migration. Part IV analyzes the gaps in communicating the significance of climate change in India. Lastly, Part V addresses how two communication theories, agenda-setting theory and narrative paradigm, can enable the media to promote more effective climate change communication in Kolkata. Additionally, it addresses the importance of strengthening media effects for effective climate change communication to help focus more attention on the risk of forced migration due to sea-level rise and flooding.

I. Climate Change Communication

Communication is defined as the production and exchange of information to inform, influence, or motivate individual, institutional, and public audiences (Maibach, Roser-Renouf & Leiserowitz, 2008). Climate change communication focuses on educating, informing, warning,

persuading, and mobilizing to address this critical problem (Yale Program on Climate Change Communication). Moreover, climate change communication should be simple because the more people understand and gain knowledge about this topic, the more that awareness of the challenge will increase. “To increase public awareness and support to respond to climate change and prepare for its impacts, the Indian people need to be educated and use communication strategies based on what they believe and what they misunderstand” (Leiserowitz & Thaker, 2012).

Many climate scientists and climate-change communicators have recently been broadcasting a message that boils down the state of things to just 12 words: “It’s warming. It’s us. We’re sure. It’s bad. We can fix it” (Deweerd, Anthropocene). After surveying 509 German adults, a study revealed that they know the basics: they know the climate is changing and that human activities are responsible. But they have a harder time distinguishing false statements about climate change from true ones. Researchers suggest that communication strategies can act as a “vaccine” against climate denial (Deweerd, Anthropocene).

Research into climate change communication has broadened significantly in recent years and now deals primarily with interdisciplinary scientific communication, the scientist-policymaker interface, international diplomacy, and media coverage and public understanding (Russill & Nyssa, 2009, p. 337). Researchers recognize that the news media is an important source of scientific information for public understanding (Russill & Nyssa, 2009). Communication interventions that influence people’s normative beliefs have shown to promote a range of relevant behaviors towards causes of climate change or global warming (Maibach, Roser-Renouf & Leiserowitz, 2008, p. 492).

Public polling suggests that print media is the major source of information to inform the public on climate change (Billett, 2010, p. 4). Media coverage of climate science is context-

dependent; influenced by ideological, organizational, and sociopolitical factors; and may evoke different public and political responses. Climate change communication in the media is more likely to inform public opinion on climate change than the latest scientific projections from the the Intergovernmental Panel on Climate Change (IPCC).

According to Johnson (2012), climate change communication covers three strategies: (1) persuasion of individuals to change their own energy use and adaptations, (2) mobilization to foster collective action to change individuals' and institutions' behavior and deliberation, and (3) collective efforts to identify problems and solutions (p. 974). Climate change communication prioritizes the relationship of communication to motivation and social change (Russill & Nyssa, 2009). Public attention rises significantly from a series of events that draw the public's attention to the harmful consequences of a problem (Arnold, 2018, p. 16). When an event affects people at a personal level, however, they are most likely to react to the events.

II. Climate Change Vulnerabilities in Kolkata

Global climate change impacts are disproportionately experienced by people in poor and developing countries (Thaker, Smith, & Leiserowitz, 2020, p. 1). Part II addresses how Kolkata is particularly vulnerable to sea-level rise and flooding. It also addresses the Sundarbans, which is an important and highly vulnerable coastal region that is being affected by sea-level rise and potential forced migration. Finally, Part II discusses the imminent threat of forced climate-induced migration into Kolkata. The Sundarban region that lies in Bangladesh is closest to the Northern part of Kolkata. Due to sea-level rise, an increased number of people from this region will migrate to Kolkata because of its accessibility.

A. *Physical Threats*

The United Nations' Global Environment Outlook 2016 reports an alarming figure of 40 million people threatened by sea-level rise in India (Jolly & Ahmad, 2019, p. 3). The long 7500 km coastline of India supports a large number of big cities that face ecological pressures (Pramanik, 2017, p. 1345). Sea-level rise causes concern mainly due to the potential habitat loss and the direct physical impact of inundation (Pramanik, 2017, p. 1344). Sea level has risen 8.5 centimeters in the past 50 years along the Indian coast (Migration Policy Institute, Panda, 2020). It is predicted that in Kolkata sea level will rise 1.4 meters by the end of the century. When Kolkata's average elevation of only 1.5-11 meters is factored in, a "double whammy" effect occurs in which physical vulnerability is exacerbated.

Thirty-six million Indians may be at risk from flooding and inundation due to sea-level rise by 2050 (Chandrashekhar, Times of India, 2019). Sea-level rise will permanently destroy extensive and highly productive low-lying coastal areas where millions of people reside (Gupta, 2014). According to the survey conducted by Leiserowitz & Thaker (2012), nearly 2 out of 3 respondents indicated that it would take their household or community several months or more to recover from a severe flood or drought (p. 11). Moreover, potential monsoonal changes and sea-level rise around the low-lying coastal areas threaten India's growing coastal cities (Billett, 2010, p. 3).

Kolkata is situated in a river delta and is vulnerable to sea-level rise (Statesman, 2013). It has been ranked as the fourth most vulnerable among 11 major coastal cities in Asia threatened by sea-level rise, and the third least prepared to adapt to its consequences (Dutta, The Hindu, 2009). Kolkata is one of the mega-cities that lies on the banks of the great rivers -- the Ganga, Narmada, Krishna, and Kaveri -- along with more than 30 other million-plus cities (Revi, 2007,

p. 214). Urbanization has been an important driver of increased flood risk in Kolkata (Ranger et al, 2011, p. 142). Typically, the urban poor reside in areas more prone to flooding and are most vulnerable to flooding and sea-level rise (Revi, 2007, p. 213). Climate change is expected to increase the severity of flooding in many Indian river basins, especially those of the Godavari and Mahanadi along the eastern coast, where Kolkata is situated (Revi, 2007, p. 215). More than 50% people living in Kolkata and its suburbs — a staggering count of 12 million – will be flooded out of their homes if the global community’s actions under the Paris Agreement fail to limit global warming to 2 degrees Celsius (Times of India, Mukherjee, 2015).

B. *The Sundarbans*

The Sundarbans region is one of the richest ecosystems globally and contains the world’s largest continuous mangrove forest, at nearly 10,000 square kilometers. About 40 percent of the Sundarbans forest lies within West Bengal; the rest is in Bangladesh. The Sundarbans have been protecting the state from cyclones since time immemorial (Government of India, 2012). “Sundarbans was simply described as a ‘cyclone shield’ for the megacity of Kolkata” (Ghosh & Boykoff, 2019, p. 148). Also, more than 3.5 million people depend on the Sundarbans for income and livelihood (Mukul et al., 2020, p. 1198).

India’s Sundarbans are characterized by high levels of poverty and exposure to natural hazards. Climate change is likely to exacerbate the situation (Migration Policy, Panda, 2020). Sea-level rise, soil and water salinization, cyclones, and flooding make this one of the most hazardous areas on the Indian subcontinent. The Indian side of the Sundarbans is submerging 2 to 4 millimeters a year. Given that the elevation level of the Sundarbans is 0.9 to 2.11 meters, this alarming rate of submergence means that many parts of this region are already facing a high risk of sea-level rise and flooding (Migration Policy, Panda, 2020).

Although managed relocation has allowed people to stay in the Sundarbans, a viable long-term solution is lacking. Somini Sengupta, a reporter for the Independent, writes that “people of Sundarbans are pouring into Kolkata.” Scientific evidence shows that the average yearly sea-level rise along the Sundarbans delta is much higher at 8 millimeters as compared to the global average of 3 millimeters annually. The report, “Mega-stress for Mega-Cities,” recommends restoration of mangroves and wetlands in the Sundarbans as among the suggestions for Kolkata to adapt to the threat of climate change (The Hindu, 2009).

C. Migration

Climate change does not confine itself to geopolitical boundaries, but migration does. Every day, vulnerable people are displaced and forced to migrate due to climate change impacts. Amali Tower, Director of Climate Refugees, a nongovernmental organization, states that, “This isn’t something that will happen, this is something happening now.” Amali Tower additionally mentions in one of her articles that South Asia has 9.5 million disaster displacements in 2019 and India recorded the highest number of disaster displacement with five million in 2019.

According to the 2020 World Migration Report, at the end of 2018 there were 28 million new internal displacements across 148 countries and territories, with 61% of these displacements caused by disasters (Imphal Free Press, 2020). “In India, in-migration of any kind is not always looked upon favorably by many state governments, and political parties find it a handy tool to foment tension between locals and migrants” (Imphal Free Press, 2020). Experts believe that by 2050 more than 200 million people will be forced to flee their homes globally (Mahapatra & Sanglomla, 2020). The Climate Change, Migration and Displacement report published by the Overseas Development Institute and the United Nations Development Programme mentions that people migrate due to social, political, economic, and other environmental reasons other than

climate change that are interconnected (Mahapatra & Sanglomla, 2020). As such, there is insufficient data to establish that migration is due exclusively to climate change. Nevertheless, it is fair to say that climate change is at least a “threat multiplier” for the risk of migration (Huntjens & Nachbar, 2015, pp. 5-8).

Most climate migrants are poor and impoverished (Imphal Free Press, 2020). According to Stojanov et al. (2016), migration is not a new phenomenon; therefore, it seems reasonable that migration would be part of the adaptation response to environmental threats like climate change (Stojanov, 2016, p. 3). Migration is an important adaptation strategy in response to climate change impacts (Jha et al., 2018, p. 122). Brown (2008) also mentions that forced migration in response to climate stresses can cause epidemic diseases (p. 34). Thus, proper migration policies are important for Kolkata and India as a whole.

Harjeet Singh wrote in the India Climate Dialogue that migration remains the only option for people who permanently lose their homes and income to climate change impacts. Rehabilitation will be a challenge for the Indian Federal Government in the near term because climate refugees from neighboring Bangladesh will also head to Bengal (TOI, Mukherjee, 2015). The scarcity of funds, inflexible infrastructure, and increased displacement of thousands of climate refugees would make it impossible for India to contain the crisis on its own (Telegraph, 2020).

In an interview that the author conducted with Dr. Stellina Jolly of South Asian University in New Delhi, Dr. Jolly observed that Odisha and Andhra Pradesh are the only two states taking proactive measures for early warnings and rehabilitation due to floods, thus reducing the mortality rate. Dr. Jolly further observed that gradual coastal erosion in coastal regions is becoming more prominent. She indicated that the outer islands of the Sundarbans have

relocated their residents to Sagar Island, the main island of the Sundarbans. Consequently, there are now infrastructure problems and a resource drain on these islands.

III. Existing Legal Framework on Climate Change and Climate Migration

This section addresses the absence of legal policies to protect climate refugees. The design of the National Action Plan on Climate Change in India at a sub-national level focuses on harnessing solar energy; enhancing energy efficiency; and promoting sustainable agriculture, integrated water resources management, and sustainable urban habitats. However, this legal response does not include strategies to address climate change displacement. India is required to submit a National Action Plan according to the Paris Agreement; however, its plan is focused exclusively on renewables, water resources, and agriculture.

Research in the Global South has emphasized issues of vulnerability and community-based adaptation, mostly at the local level (Gupta, 2019). Issues such as governance of adaptation at different levels remains poorly studied in South Asia (Gupta, 2019). Most of the climate change national programs adopted by South Asian countries identify climate change-induced displacement but do not address it in a significant manner, and the challenge is to prepare for climate-induced migration (Jolly & Ahmad, 2019, p. 259).

A. India's National Laws and Policies

India's State Action Plans on Climate Change serve as the primary policy document at the sub-national level to address vulnerabilities related to climate change and implement necessary infrastructure projects and policies; however, very little focus has been given to displacement due to climate-related hazards. Although separate policies on coastal zone management exist at national and state levels, they barely examine the human impacts of displacement and instead largely focus on the development of climate-resilient infrastructure and

other measures such as protective sea walls and dikes (Migration Policy Institute, Panda, 2020). There are no legally binding laws in place for climate displaced migrants (Jolly & Ahmed, 2019). Courts in India have not been receptive to the plight of international refugees (Jolly & Ahmed, 2019, p. 206). Most refugees faced imprisonment for a specified period because free movement in India for refugees is not allowed (Jolly & Ahmed, 2019, p. 206).

The Indian government is managing the mangroves efficiently in 38 selected areas along the Indian coastline (p. 221). At a national level, however, there are not many policies for strategic relocation for those affected by climate change (Migration Policy Institute, Panda, 2020). India's current migration plan to protect coastal communities only provides short-term solutions.

Dr. Stellina Jolly stated that, "India's legal mission towards climate refugees is slow to emerge. India does not have long-term visions for climate refugees. Most of India's initiatives are short-term, like the temporary relocation of communities or reconstruction of affected areas. Bangladesh has climate change included at a policy level and has some funding mechanisms in place." Dr. Jolly further noted that there is a lack of coordination in the Indian policy system. There is no data available regarding how many climate refugees have been displaced due to climate change. India does not have a policy for climate refugees because the government looks for policies in place at an international level. The National Action Climate Plan mentions climate adaptation; however, it lacks a resettlement plan. Finally, there are no pending laws in India in regards to climate refugees.

There needs to be better leadership in the Indian Government to enhance communication of the risks of climate change to the poorest or vulnerable communities. In an interview with Dr. Badrinarayana, Professor at Chapman University, she noted that there are NGOs that

communicate about climate change to vulnerable populations, but no direct government involvement.

Krishnendu Mukherjee, reporter from Times of India, mentioned that the government reactions to climate change or climate refugees are not very direct. Response to calamities are very straightforward. He noted that due to sea-level rise, the government has built many shelters in coastal regions. The typical response from the government is a flood warning system or a supply line — there are standard operating procedures in place to provide relief to the flood victims. There is no attention given to climate migration, however.

B. State and Local Laws and Policies

Local-level policies in India have responded to climate migrants in coastal communities; however, the response has not addressed current and future impacts resulting from sea-level rise and flooding (Migration Policy Institute, Panda, 2020). The central government, with the help of state governments, has invested resources and funding projects to control erosion by raising embankments and installing a system of river-training supports to capture sediment and slow the river's flow. But these measures have not proven as effective as expected. West Bengal has an existing state action plan, however, it lacks policies to address “climate refugees” or “climate migration.”

In 2019, the 29 states in India planned to revise their five-year State Action Plans for Climate Change (SAPCC), which are intended to integrate climate change concerns into mainstream government planning processes (World Resources Institute, Ginoya & Narayan, 2019). Addressing local concerns is also important because Indian states have primary jurisdiction over the country's water and agriculture sectors, two of the areas most impacted by climate change (World Resources Institute, Ginoya & Narayan, 2019).

Different states have climate disaster policies in place that help vulnerable populations that other states can adopt. For example, Odisha's government used its legal authority to relocate residents from hazard-prone areas. Although the relocation has been praised as an effective strategy, there has been criticism about the resettlement policy, lack of fair compensation and post-settlement livelihoods, the number of houses being resettled from the original location, and migrants being sent back to their villages. The current development strategy, which encourages migration into resource-rich areas and hampers long-term vulnerability reduction and economic development, will lead to increased human vulnerability to sea-level rise (Migration Policy Institute, Panda, 2020).

On the other hand, the State of West Bengal has prepared the State Climate Change Action Plan (SCCAP) to introduce climate adaptation programmes (Govt. of West Bengal). Efforts are underway to mainstream climate change concerns into development decisions and other government initiatives. However, coordination of activities across government agencies involved with combating climate change, such as the departments of health, environment, and transportation, demands specific attention and dedicated efforts (Govt. of West Bengal). West Bengal's State Action Plan suggests adaptation strategies, however, none of these strategies speaks to climate change-induced migration. The term "climate refugees" does not exist in the State Action Plan for West Bengal.

Kerala is one state that is playing a vital role for climate refugees. It has a participatory democracy system and the highest literacy rate in the country at 96.2%. Kerala is a decentralized state, the local government is strong, and the participation rate of the people is high. Similarly, West Bengal's literacy rate is 76.26%. West Bengal has the capacity to adapt Kerala's actions to provide protective measures for climate refugees. Additionally, Dr. Badrinarayana states that

West Bengal has a strong sense of communism and Kolkata as well has a strong sense of community and intellectual life.

Lastly, there is a need to mainstream information on climate risks into planning and delivery of urban infrastructure and services, while strengthening local capacity to act on that information (Sarkar, India Climate Dialogue, 2019). Dr. Jolly mentions that there is a disaster management system in place for when a storm is approaching in India. Kolkata can build on this mechanism to communicate the seriousness of climate change-induced migration.

IV. Gaps in Climate Change Communication in India

India is relatively new to climate change communication research despite its high rank in greenhouse gas emissions. Yet as one of the world's most vulnerable countries to climate change, (Leiserowitz & Thaker, 2012, pg. 5), it is imperative for climate change communication to improve. This section seeks to explain the missing links in climate change communication in India. There is a pressing need to bridge the gaps between climate change communication and public awareness in India. This section addresses the need for the media to use jargon-free language to communicate climate change, the need to increase vernacular journalists, and the challenge to change the Indian mindset and raise awareness of climate change as a pressing reality.

This section also explores the challenges that India faces in climate change communication to set a context for the recommendations in Part V of the paper. It is important to address these issues to enhance public awareness of climate change and climate-induced migration. Delays in sharing relevant information with the public on these issues can cause harsh consequences. If the appropriate information and warning system does not reach the public, it would strain the Indian Government to manage disasters as well as climate refugees.

The media spreads awareness of climate change being human-caused, however, there are not many changes to recent coverage to reflect the imminent threat of climate change-induced displacement. There are two English language newspapers that cover issues of climate change: *Times of India* and *Telegraph*. *Times of India* has covered a series of stories on climate change, climate refugees, the Sundarbans, and vulnerable areas, but coverage is still limited. Newspapers place more emphasis on air pollution than sea-level rise. Krishnendu Mukherjee, *Times of India* reporter, also mentioned that these journalists perceived that scientists do not communicate about climate change in jargon-free language, which could make it difficult for journalists to cover climate change news stories effectively.

Most articles on climate change are covered by English newspapers. *Times of India* and *Telegraph* have policies to report on environmental issues but reporting is still inadequate. Both *Times of India* and *Telegraph* are inadequate in their climate change coverage, but each has much better climate change coverage than the local papers. This predominant coverage of climate change issues in these two papers in English limits climate change communication at a country-wide level because each state in India speaks a different language.

A climate outreach report noted that climate change and global warming are understood by most English speakers; however, these terms can be translated into regional languages to be more relevant for local populations. According to Krishnendu Mukherjee, *Times of India* and Chandrima Bhattacharya, *Telegraph*, there are two Bengali newspapers hardly covering climate change: *Ananda Bazar* and *Ei Somoy*. In addition, there is also insufficient coverage in English newspapers. In the eastern part of India, journalists who cover environment are not well versed in sea-level rise and climate change. Further, many media interviewees mentioned that editors of newspapers are not adequately aware of the issues. Chandrima Bhattacharya further stated that

coverage of politics gets priority over everything else and news rooms may not be educated about the implications of climate change. Additionally, in the interview conducted with Krishnendu Mukherjee, he mentioned that although there is an influx of people moving from Sundarbans to West Bengal, the media's coverage of this migration is not connected to climate change.

Indians have observed climate change in their respective areas; however, they have not understood threats of imminent forced migration. (Leiserowitz & Thaker, 2012, p. 18). The biggest challenge India faces is changing the Indian mindset. Many believe that the West has burdened them with this issue. Another misconception editors of newspapers have is that Kolkata is inland and will not be affected by sea-level rise. The environmental journalists try to convince editors about the sea-level rise crisis; however, the editors feel like readers might not be interested to read such stories.

Prior research (Gallup 2010) found that only 37 percent of Indians nationally say they know “a great deal” or “something” about global warming (Leiserowitz & Thaker, 2012, p. 18). At the Qatar Sustainability Expo on Climate Change Communication Research, Dr. Jagadish Thaker emphasized how only 7% of Indians say they know facts about climate change, 51% know some or little about climate change, and 40% of the people are unfamiliar with climate change. This shows that a majority of Indians may not know about climate change as a conceptual framework to make sense of the changes in their local area and make decisions about their future.

Dr. Thaker further noted that the public wants to know more about local impacts of climate change and are willing to pay more attention to climate change policies. However, the government should be urged to act on climate change. The underlying problem in India is

insufficient media coverage of climate change reaching the local communities. Effective climate communication could promote increased public knowledge about the climate change crisis and motivate public demand for better government responses to climate change and climate refugees.

V. Communication Theories to Improve Climate Change Communication in Kolkata

A lack of public understanding and awareness is likely to result in low demand for government action on climate change in a democracy (Thaker, 2017, p. 13). Parts A and B of this section propose communication theories that can provide a platform for journalists to increase awareness of climate change as an imminent threat. Part C recommends a variety of strategies to strengthen media effects for enhancing climate communication to underscore the risk of forced migration.

A. Agenda-Setting Theory

Agenda-setting theory was developed based on the research of Maxwell E. McCombs and Donald Shaw. There are three assumptions of Agenda-setting theory: (1) the media establish an agenda and in so doing are not simply reflecting reality, but are shaping and filtering reality for the public, (2) the media's concentration on the issues that comprise their agenda influence the public's agenda, and these together influence the policymakers' agenda, and (3) the public and policy makers have the opportunity to influence the media's agenda as well. Using agenda-setting theory, the media can provide a lens to understand and reflect on social reality (West & Turner, 2019, p. 359). The second assumption described above would be very helpful in communicating climate change to the public because when the media focuses on an agenda it influences the public's agenda and the agenda of the decision makers, in this case the climate change audience (West & Turner, 2019). Persuading people about climate change when the majority of the public is preoccupied with more immediate issues is a challenge, however.

Agenda-setting theory describes the ability of the news media to influence the importance of topics in public agenda. The media places emphasis on a specific topic and influences how the public perceives the news. Agenda-setting theory is used widely in the mass media. The repetition of messages about public issues in the news day after day, along with the pervasiveness of the mass media in our daily lives, constitute a major source of journalism's influence on the audience (McCombs & Valenzuela, 2007, p. 46). In other words, agenda-setting refers to a strong relation between the emphasis the mass media places on certain issues and the importance attributed to these issues by mass audiences (Scheufele & Tewksbury, 2007, p. 11).

Making issues like climate change more salient in people's minds, by using agenda-setting theory, can also shape the responses that people take regarding climate change. For example, during COVID-19 the media has focused its coverage on the importance of wearing masks, social distancing, avoiding indoor spaces, and the potential vaccine. The way the media delivers these messages can also be utilized to deliver climate change messaging. Therefore, when the media draws attention to climate change as a current rather than future challenge, people would respond to the short-term threats from climate change. According to Michael Phillips-Anderson, Associate Professor of Communication at Monmouth University, "Agenda-setting theory provides an important lens for considering the effectiveness of climate change communication. It is difficult to get the public to attend to most issues. If the media doesn't choose to make environmental issues part of the agenda, then most people will not know that it is a topic of concern or consider the issue to be less important than if there was more attention focused on it."

Agenda-setting theory addresses two levels of media: media framing and priming. West and Turner (2019) define media framing as how media depictions of events influence and

constrain the way audience can interpret events. Additionally, framing involves selecting some aspects of a perceived reality to make them more salient (Weaver, 2007, p. 143). Framing is the process of selective control (communicationtheory.org). According to Maxwell and Sebastian (2007), media framing is a central organizing idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion, and elaboration (McCombs & Valenzuela, 2007, p. 47). Framing would be extremely useful to promote climate change communication in India. This way the media's agenda to increase climate change and climate refugee awareness would interact with what the public thinks about these topics.

An interesting example of agenda-setting theory that focuses on vulnerable and poor communities through Bangladeshi radio clubs is easily adaptable to the Kolkata and West Bengal contexts. Community Radio Clubs in Bangladesh were created to help climate change-impacted communities that in turn inspire girls be a part of the solution to extreme weather impacts, rather than burdens to society. Kolkata's communities can promote awareness of climate change through young women because climate change is an existential threat with the unique power to undermine all the progress society is making (climate home news, 2019). The natives of the Sundarban Islands, West Bengal can use a similar technique to promote awareness of the vulnerability and need to adapt to climate change through their young women and radio. West Bengal has a similar governance framework and socioeconomic circumstances compared to Bangladesh, hence, replicating this communication technique would be beneficial. "When we empower young women to play a part in building comprehensive climate solutions, they discover the agency and power to shape their own future and to improve the future for society as a whole" (climate home news, 2019). This also utilizes agenda-setting theory to focus on vulnerable and poor communities in Kolkata and West Bengal overall.

Agenda-setting theory, for example, suggests that increased media coverage increases issue salience in the public. Sampei and Aoyagi-Usui (2009) found that an increase in mass media coverage of global warming was associated with rising public concern in Japan, albeit for a short period of time (Thaker, Zhao, & Leiserowitz, 2017, p. 356). An interview with Jayanta Basu, reporter at *Telegraph*, says that the media in India prioritizes events or phenomena that have immediate impact. He mentions, “how media coverage of climate change is increasing, but not enough in mainstream media, particularly in the Indian language media, at least in Bengal. It is still often seen as a ‘global’ phenomenon, therefore happening elsewhere in the world, not ‘local’ enough.” The goal of agenda-setting theory is not to overwhelm the audience with media coverage but to make it simple and real.

Jayanta Basu further states that it is important to mainstream climate change coverage into local media to spread awareness on climate change. For example, he worked on a climate change communication strategy project for the Sundarbans. The group determined that coverage of climate issues in the Sundarbans should be addressed at the international level. Within a year and a half, experts on climate change trained journalists on the scientific background and now there are 1000 articles in local, national, and international media.

B. *Narrative Paradigm*

Narrative paradigm is based on the research of Walter Fisher. Narrative paradigm has five assumptions: (1) humans are natural storytellers, (2) decisions about a story’s worth is based on the “good reasons,” (3) good reasons are determined by history, biography, culture, and character, (4) rationality is based on people’s judgements of a story’s consistency and truthfulness, and (5) we experience the world as filled with stories, and we must choose among them (West & Turner, 2019, p. 342). Fisher believes that any ethic requires a narrative (West &

Turner, 2019, p. 342). People make decisions based on what makes sense to them and accept or reject the story accordingly (West & Turner, 2019). It is vital to increase communication on climate change; however, it is equally critical to create a reliable context for the story. For example, in India some newspapers have a comics section. It would be ideal for newspapers to incorporate animated stories about climate change or the potential outcomes like migration. Professor Phillips-Anderson observed that, “for those interested in engaging the public about the dangers of climate change, it is important that they consider the form their communication takes. Humans are persuaded by narratives and regularly use them to organize and communicate their own experiences. In order to help people understand the dangers of climate change and the impact on their lives, it will be helpful to engage the audience with stories (that are realistic and supported by credible evidence) that can help them envision what the world will be like if nothing is done to alter the trajectory of climate change.”

A narrative is any verbal or nonverbal interpretation arranged logically to generate meaning (communication theory.org). Communication is mostly influenced by experience. *Wade*, a new animated film about the climate crisis, is a fraught and intense nine-minute watch. *Wade* imagines what will happen if a rising sea level flood Kolkata, with humans and animals alike sloshing through thigh-deep, litter-strewn water. “Animation also has the honor of being a core medium for children. If they get the message early on, the future gets even more hopeful.” (India Climate Dialogue, Natalie Taylor, 2020). This animated film targets the population in Kolkata making it a more relevant film for this region to watch.

Increasing the number of children watching films like *Wade* would cause climate change awareness to increase dramatically in the future. This film seeks to connect people’s experiences with climate change and the need to start thinking about migration. Effective climate

communication requires more focus on local and regional rather than global impacts (pg. 12). Therefore, using animated films like *Wade* that focus on the people in Kolkata are most relevant for a specific audience. On the other hand, Krishnendu Kuntak, *Times of India* reporter, mentioned that he had heard about *Wade*, but there was not coverage on the film locally in Kolkata. If the media uses this form of narrative to tell the story of what is currently happening and a depiction of what will happen, it will increase the level of awareness in the public in India. The Indian media can create powerful narratives and find themes relevant to various climate change threats in India (Mittal, 2012, p. 220). In addition, Bangladesh circulates children's newspapers and it would be a great idea for Kolkata to adopt this strategy to communicate with youth. Future generations are important to educate and inspire on climate change awareness. A short 10-page children's newspaper that also covers climate change and migration would be ideal.

Narrative as a form of persuasion is effective only if the audience finds the story believable. Additionally, narrative coherence is extremely important when conveying a story. The audience reading or listening to a news story should believe what the media is reporting. If the causes and effects of climate change do not sound coherent, the audience can reject or ignore the story. Communicating is effective only if the listener has some coherence, which is the degree of sense making of a narrative (communicationtheory.org). For example, when the media states that sea-level rise will destroy cities by 2050, the audience is wondering how that will be a reality. This is called narrative fidelity. Therefore, a person's experience as well as truth of the story influences whether or not to accept a narrative.

C. *Strengthening Media Effects*

Agenda-setting theory and narrative paradigm will help increase climate change communication outreach in India. However, improving smaller and simpler aspects of the media that cannot be covered by the two communication theories is equally essential. These adjustments can be strengthened by the different levels of the media.

In India, the climate change policymaking process in particular, and policymaking in general, are closed-door affairs, with a few important entities—such as Center for Science and Environment (CSE), The Energy and Resources Institute (TERI), and some energy experts—playing an important role in the shaping of climate change policy. With the vulnerability of India becoming more apparent, and questions of domestic equity rising, a variety of discourses have emerged in India (Thaker, 2017, p. 4). Climate coverage in wealthier countries tends to focus on science and domestic policy, while coverage in countries with fewer resources is dominated by international relations and weather-related disasters (DeWeerd, Anthropocene).

The Indian media effectively uses “Climate Change,” “Global Warming,” “Greenhouse Gas,” and “IPCC” in their climate change media analyses (Billett, 2010, p. 5). To improve awareness of climate refugees, the media should increase its use of related words like “migration,” “climate displacement,” and “climate refugees.” The media has spread the overall message of what climate change is broadly; however, they have not captured how climate change impacts will result in potential forced migration. For example, only 108 newspaper articles directly referenced climate change and how it is having an impact in India (Billett, 2010, p. 7). Worse still, four newspapers target and reach a readership that is restricted to the socioeconomic elite (Billett, 2010, p. 15). Only a few studies have evaluated Indian media coverage of climate change, and most of these focus on English newspapers. Recent studies determined that Indian media coverage of global warming has been low relative to other countries, with only 6% of all

stories published in Indian newspapers compared to 34% in the U.S. and 19% in the U.K. (Thaker, 2017, p. 6). Jayanta Basu emphasizes the need for journalists to be trained to connect the science, economic, societal, and political dimensions of climate change at a local level.

All India Radio is an effective mechanism to reach rural areas in India. This service is available throughout India in multiple languages. Although this channel has not attracted the attention of urban listeners, rural populations are left with no choice but to receive news through the radio. Cricketers and Bollywood actors could also enhance communication of the threat of climate change and its potential solution like migration. People in India pay more attention to notable figures rather than newspapers or news channels.

The media needs to be precise and intentional about how it conveys climate change to the public. Dr. Jolly states that the media covers environmental events like the Paris Agreement, however, there is no specific coverage of climate refugees. Dr. Jagadish Thaker, at the Qatar Sustainability Expo, also mentioned that the Indian media's coverage on climate change is sporadic; they only cover such topics when there are climate events taking place. Additionally, Dr. Badrinarayana noted that the media provide coverage of floods taking place in areas but do not indicate the connection between climate change and extreme weather events. The media also does not refer to the root cause of why flooding is taking place. Dr. Bardinarayana believes climate change messages should be reached through our future generations. Some high-end schools in India do teach environmental courses, but climate change education needs to be implemented on a much broader scale.

Conclusion

“News about the environment, environmental disasters, and environmental issues or problems does not happen by itself, but is ... “produced,” “manufactured,” or “constructed”

— *Dr. Anders Hansen*

Climate change communication is a fairly new concept, however, the need for effective communication is growing. Public engagement is essential to increase public awareness of climate change. The Indian public needs to understand that climate change is happening at the moment and is not merely a distant threat. People generalize about what is happening in the moment until they are personally affected by climate change. The poorest populations in India and other developing countries are currently witnessing and facing the disasters of climate change like sea-level rise and flooding. Consequently, it is vital to spread information and communicate about these threats and create a potential long-term solution.

Additionally, it is important to address physical threats like sea-level rise and flooding because it is a fast-growing concern and extremely threatening to developing countries like India. Many families are being affected due to these threats that influence their livelihood, settlements, and daily necessities. Instead of solving the climate refugee problem through short-term goals, there should be long-term policies in place to better manage millions of people migrating at the same time into Kolkata.

Agenda-setting theory and narrative paradigm can offer strategies to increase effective outreach to the most vulnerable populations. Agenda-setting theory focuses on the quantity of media to be produced and narrative theory focuses on the quality of the media articles. If there is a lack of media coverage and an insufficient number of believable stories, people will not draw their attention to those stories. These two proposed communication theories would help promote public awareness of the need to apply pressure to the Indian Government to take legal measures to protect climate refugees in India.

Bibliography

- Antilla, L. (2014). Climate change in the media: reporting risk and uncertainty. *Environmental Communication*, 8(4), 551–553.
- Arnold, A. (2018). Climate change and Storytelling: Narratives and Cultural Meaning in Environmental Communication. *Palgrave Studies in Environmental Sociology and Policy*.
- Billett, S. (2010). Dividing climate change: global warming in the Indian mass media. *Climate change*, 1-16.
- Ballantyne, A. G. (2016). Climate change communication: what can we learn from communication theory? *Wiley Periodicals*, 7, 329-344.
- Chandrashekhar, V. (2019, Oct 31). '36m indians at flood risk due to sea level rise by 2050' [times nation]. *The Times of India (Online)* Retrieved from <https://ezproxy.monmouth.edu/login?url=https://www-proquest-com.ezproxy.monmouth.edu/newspapers/36m-indians-at-flood-risk-due-sea-level-rise-2050/docview/2310516952/se-2?accountid=12532>
- Druschke, C. G. and McGreavy (2016). Why Rhetoric matters for ecology. *Front Ecol Environ*, 14(1), 46-52.
- Deweerd, S. As climate changes, what changes people's minds? *Anthropocene*
- Ginoya, N., Narayan, U., and Worker, J. (2019). As India revises state climate plans, who should have a voice? *World Resouces Institute*

- Ghost, A. and Boykoff, M. (2019). Framing sustainability and climate change: Interrogating discourses in vernacular and English-language media in Sundarbans, India. *Geoforum*, 99, 142-153.
- Gupta, J. (2019). Climate adaptation impossible without community participation. *India Climate Dialogue*
- Huntjens, P. and Nachbar, K. (2015). Climate change as a threat multiplier for Human Disaster and conflict. *The Hague Institute for Global Justice*.
- Imphal (2020). How to deal with climate migration in India. *Imphal Free Press*.
- Jha, C. K., Gupta, V., Chattopadhyay, U., and Sreeraman, B. A. (2017). Migration as adaptation strategy to cope with climate change: A study of farmers' migration in rural India. *International Journal of Climate Change Strategies and Management*, 10(1), 121-141.
- Johnson, B. B. (2011). Climate Change Communication: A provocative inquiry into motives, meanings, and means. *Risk analysis*, 32(6), 973-991.
- Jolly, S. and Ahmad, N. (2019). *Climate Refugees in South Asia*.
- Kahn, C. (2014). The Climate of Newspaper Coverage: Communication of Climate Change Uncertainty in India. *ProQuest LLC*.
- Leiserowitz, A., and Thaker, J. (2012). Climate Change in the Indian Mind. *Yale Project on Climate Change Communication*, 1-219.
- Mittal, R. (2012). Climate Change Coverage in Indian Print Media: A Discourse Analysis. *The International Journal of Climate Change: Impacts and Responses*, 3(2), 221-231.
- McCombs, M. and Valensuela, S. (2007). The Agenda-Setting Theory. *Pontificia Universidad Católica de Chile*, 44-50.
- Marshall, G., Yashwant, S., Shaw, C. and Clarke, J. (2017). Communicating climate change in

- India: a Global Narratives project. *Oxford: Climate Outreach*.
- McCombs, M. (2005). A Look at Agenda-setting: past, present and future. *Journalism Studies*, 6(4), 543-557.
- Maibach, E. W., Rose-Renouf, C., and Leiserowitz, A. (2008). Communication and Marketing As Climate Change–Intervention Assets A Public Health Perspective. *American Journal of Preventive Medicine*, 35(5), 488-500.
- Mukul, S. A., Huq, S., Seddon, N. and Laurance, W.F. (2020). Saving the Sundarbans from development. *Science*. Retrieved from <https://doi.org/10.1126/science.abb9448>
- Mukherjee, K. (2015). Kolkata in vortex of climate refugee crisis. *Times of India*
- Nerlich, B., Koteyko, N., and Brown, B. (2010). John Wiley & Sons, 1, 97-110.
- Pezzullo, P. C. (2018). *Environmental Communication and the Public Sphere. Sage Publications.*
- Pramanik, M. K. (2017). Impacts of predicted sea level rise on land use/land cover categories of the adjacent coastal areas of Mumbai megacity, India. *Environ Dev Sustain* 19, 1343–1366.
- Ramesh, R. and Bhatt, J R (2018). *Climate Change and the Vulnerable Indian Coast. Ministry of Environment, Forest and Climate Change.*
- Ranger, N., Hallegatte, S., Bhattacharya, S., Bachu, M., Priya, S., Dhore, K., Rafique, F., Mathur, P., Naville, N., Henreit, F., Herweijer, C., Pohit, S., and Corefee-Morlot, J. (2011). An assessment of the potential impact of climate change on flood risk in Mumbai. *Graham Research Institute on Climate Change and the Environment*, 139-167, DOI 10.1007/s10584-010-9979-2.
- Revi, A. (2008). Climate change risk: an adaptation and mitigation agenda for Indian cities. *International Institute for Environment and Development*, 20(1), 207-229.

- Russill, C. and Nyssa, Z. (2009). The tipping point trend in climate change communication. *Global Environmental Change*, 19(3), 336-344.
- Sengupta, S. (2018). Kolkata is becoming an unnecessary climate casualty – it didn't have to be.
- Stojanov, R., Kelman, I., Ullah, A., Duzi, B., Procházka, D., and Blahutová, K. (2016). Local Expert Perceptions of Migration as a climate change adaptation in Bangladesh. *Sustainability*, 8(12), 1223.
- Statesman (2013). Kolkata.
- Scheufele, D. A. and Tewksbury, D. (2007). Framing, Agenda Setting, and Priming: The Evolution of Three Media Effects Models. *Journal of Communication*, 57, 9-20.
- Tower, A. (2020). Cyclone Amphan puts focus back on millions displaced by climate disaster. Climate Refugees. <https://www.climate-refugees.org/>
- Times of India (2009). Rise in sea level may hit Kolkata. Bennett, Coleman & Company Limited. <https://ezproxy.monmouth.edu/login?url=https://www.proquest.com/docview/428927736?accountid=12532>
- The Hindu (2009). Sea-level rise.
- Thaker, J. (2017). Climate Change Communication in India. Oxford Research Encyclopedia of Climate Science.
- Thaker, J., Zhao, X., and Lerserowitz, A. (2017). Media use and public perceptions of global warming in India. *Environmental Communication*, 11(3), 353-369.
- Taylor, N. (2020). What if Kolkata was swamped in climate horror. *India Climate Dialogue*

- Panda, A. (2020). Climate change, displacement, and managed retreat in coastal India. *Migration Policy Institute*
- The Editorial Board (2020). Climate Cloud: Paris pact and more. *The Telegraph online*
- Mahapatra, R. and Sangomla, A. (2020). Migration out of climate change: Disaster-induced migration outstrips that due to conflicts.
- West, R. and Turner, L. H. (2018). Introducing Communication Theory: Analysis and Application. *McGraw Hill Education*.
- West Bengal State Action Plan on Climate Change, *Government of India* (2012)
- Walsh, L. (2015). The visual rhetoric of climate change. *John Wiley and Sons*, 6, 361-368.
- Weaver, D. H. (2007). Thoughts on Agenda Setting, Framing, Priming. *Journal of Communication*, 57(1), 142-147.