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RISK JOURNALISM BETWEEN

TRANSNATIONAL POLITICS

AND CLIMATE CHANGE

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Risk Journalism between Transnational Politics and Climate Change

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Dedicated to the memory of Ulrich Beck, a mentor, colleague—and friend

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Introduction

Over the past years, the transnational debate of climate change has shifted. While only two decades ago, climate change was seen as a future risk of melting polar glacier caps, rising sea levels of oceans and implications of CO_2 emissions on the environment, these processes of planetary destruction are today significant—climate change has become not only a reality but also a catastrophe which requires urgent policy approaches to minimize further implications on a global scale.

Today, the transnationally highly politicized climate change debate focuses on concrete policy measures, such as processes of intergovernmental collaboration, global climate governance, dimensions of political environmental agency, accountability and legitimacy as well as 'green' civic identity. In other words, the debate is shifting away from national angles towards a new trans-societal policy terrain aiming to manage not 'just' an ambiguous globalized 'risk' (Beck 2009) emerging 'in the future' but to somehow control a concrete crisis of—as it seems—already severe environmental destruction.

Due to this matter of urgency, not only climate change 'as such' but climate governance is now moving into the focus of a world society to establish policy debates in new spheres beyond traditions of national/international relations. Governments of all world regions are forced to closely collaborate in a new policy dimension of equal interdependence

across societies. It is a new perspective of a trans-societal political domain which already begins to produce policy measures. These are now less addressing the territorially 'bounded' national climate crisis but, in a new perception which politicizes globalized dense risk scenarios, the interdependence between phenomena.

It is also a new policy arena as it broadens the scope of actors to include multi-level stakeholders, policymakers, activists and citizens across societies—from industrialized countries and small Pacific island nations, from developing and developed world regions and all types of societies, democratic, authoritarian and so-called 'failed' states who specifically suffer from the implications of the climatic crisis. The traditional nationally oriented paradigm of domestic/foreign policy and even of international relations are more and more replaced by 'horizontal' public policy domains, emerging as trans-societal axes of global/local or local/local or, as cities in Indonesia are facing the same crises as cities in Mexico, Spain and Saudi Arabia, even city/city governance across all types of societies.

The need to shift from a national perspective to such a 'horizontal' trans-societal angle is also—and we should say: specifically!—important in the field of climate change journalism, as journalists are becoming 'actors' in broadened global climate policy domains. In today's advanced stage of environmental crisis, climate change journalism can simply no longer be seen as 'just' a thematic 'add-on' or a side field of national/foreign journalism where—as various studies show—journalists in Western and non-Western regions struggle to somehow 'squeeze' at least some climate change stories into the daily news 'beat' format of traditional domestic/foreign journalism of, for example, national media. Climate change stories are—except for the coverage of important international conferences—seen as 'slow' news and are sidelined, appear in 'weak' frames in comparison with the highly dynamic daily 'breaking' news flows.

However, we have to perceive climate change journalism as a new journalistic field which requires more attention in journalism studies worldwide. It is a new journalism field which has—given the intensity of the politicized globalized interdependence of climate policy domains—an important public role as 'communicator' of the complexity of the cosmopolitan reality of climate change. Climate change journalism is no longer 'just' about addressing 'issues' but communicates the cosmopolitan reality of climate crises, and global risk governance

to critically engage with measures of legitimacy and accountability of these global policy terrains again in a cosmopolitan perspective.

Although the spheres of communication and journalism are drivers of 'risk' awareness—for example, through the 'magnifying' of climate crises, peer-to-peer viral communication via social media, through big data and digital interactions across societies—climate change journalism and the larger field of what we might call 'risk' journalism are still on the periphery of journalism studies.

Journalism dealing with globalized 'risk' is mainly understood (and assessed) in the domains of domestic/foreign reporting. In consequence, conceptual frameworks of the role of journalism in such a globalized risk arena, methodologies and methods are aligned with the traditions of journalism research which emerged at the time of national mainstream media. While, more than a decade ago, some journalism scholars already made attempts to emphasize the crucial need for new methodological debates to identify the dimension of journalism in globalized landscapes and suggested a focus on the 'global journalist' (Reese 2001), on 'cosmopolitan', 'risk' communication (Cottle 2006) and the conceptualization of transnational dimensions of 'risk' (Berglez 2008) and global public spheres (Volkmer 2014), these approaches have never reached the main research agenda of journalism studies.

The majority of studies of climate change journalism have a national scope, even in international comparison of national journalism. As studies build on methodological traditions of national journalism and mainly address the output of mainstream media, such as national newspapers, it is not surprising that research is mainly news output oriented and identifies the way how national mainstream (print) media frame climate change and define the agenda in national contexts. Most studies have a focus on the USA and European countries (e.g. Brossard et al. 2004; Boykoff 2007a, b). A frequently adopted approach—specifically relating to transnational debates—is to assess the national coverage of meetings of the International Panel on Climate Change (IPCC).

Overall, it seems—with very few exceptions—that (1) a focus on the Western world or (2) a comparison with Western countries by including a few developing countries (e.g. Midtun et al. 2015; Brueggemann and Engesser 2017) is still dominating the research agenda in Europe and the USA. Without doubt, nationally oriented studies have produced important insight into national climate change debates and the way how

globalized policies are reflected along a national governance agenda at a time when Western nations took a lead in globalized climate change policy. However, we are now at a phase of heightened globalized interdependent climate change crises in a new domain of intense globalized climate governance and multi-stakeholder interaction on a globalized level which is developing policy frameworks for all societies. In the contours of such an emerging interdependent policy regime, the dominance of Western countries in journalism research can only produce a one-dimensional risk perception which now needs to be broadened to assess the 'reflexivity' of risk perception across other world regions.

Of course, a reason for the dominance of Western world regions in empirical research of climate change journalism is the relative silence of journalism scholars from non-Western regions which was the case until a few years ago. This silence was caused by the fact that climate change was not on the public agenda of some developing regions until a few years ago. The current increasing awareness among researchers of developing regions is related to a new inclusive policy approach of the IPCC requiring measures of all world regions to tackle the crisis. As climate change governance is now becoming a key domain for all societies, journalism scholars from developing regions are beginning to assess climate change journalism and—not surprisingly!—these studies reveal quite a different 'reflexive' dimension of risk perception and understanding of climate change as a journalistic field.

For example, scholars from Argentina (Mercado 2012), Uganda (Semujju 2013), Fiji (2015), China (Han et al. 2017) and Bangladesh (Rhaman 2016) tend to move away from a 'media output centric' view in order to assess the larger complexity of climate change journalism and relate climate change policies to sustainable societal development and progress. Studies address, for example, the links between transnational NGOs and their influence on the journalistic news agenda, such as in South Africa (Kwenda 2013). A study from Bangladesh argues that journalists, covering climate change, need to adopt new roles as societal 'actors' to actively interrogate in the political process of 'social change' and journalists need to be 'ready to move beyond the professional mindset of the distant observer and neutral reporter to intervene in any situation that requires action' (Das 2012, p. 228).

To begin to reposition the field, it might be useful first of all to look across disciplinary borders as this debate requires interdisciplinary approaches. An interdisciplinary debate as other disciplines, such

as political science and sociology, policy domains addressing 'risk' and globalized interdependence of diverse risk formations—from climate change to migration and terrorism—are conceptualized as new domains of world politics (e.g. Albert 2016) in the parameter of a world society paradigm.

For example, specific approaches in political science address new formations of environmental security or—in the context of conceptualizing new types of globalized imbalances—a 'growing ecological disconnectedness and disembeddedness between people and places' which results in an 'environmental load displacement' from the North to the South (Christoff and Eckersley 2013, p. 19). More recent debates relate globalized 'risk' interdependence to migration processes and a call for a new policy angle as an outcome of climate change (Froehlich and Bettini 2017) others emphasize the new role of cities and 'urban governance'—in regions of the global North and South (Castan Broto 2017).

In sociology, the conceptualization of globalized interdependence of 'risk' debates is quite advanced. Sociological debates of relativistic 'globalization' began in the 1970s and fully emerged in the early 1990s. For example, the interdependence of humanitarian crises was understood as a dimension of complex 'global humanity' and theorized in the interdependence of 'glocalization' (Robertson 1992) some decades ago. A decade later and due to the increasing densities of transnational communication processes and a turn to globalized epistemology which has not been adopted in communication and journalism studies, Robertson highlighted the shift towards an epistemic globalized, yet, relativistic notion of 'world consciousness' (Robertson and Inglis 2004). The notion of the epistemic dimensions of 'world consciousness' and the concern for humanity allowed to set the stage for more specific debates, such as the process of 'cosmopolitanization' of societies (Beck 2008) and a globalized 'outlook' (Beck 2009) which served in sociology as new paradigmatic orientation points for overcoming the traditions of 'modernity'. Given the advanced stage of the sociological debate in these areas, it is not surprising that recently another paradigmatic reorientation of the entire field of sociology towards global environmental sociology as a completely new conceptual terrain has been suggested. Such a new discipline of global environmental sociology is seen as 'unified around the world in terms of the themes that are studied and the theories that are applied and developed—in short, it is a 'common epistemology and methodology' as the observation of a place-based divergence

in sociological approaches to (global) environmental challenges seem an oxymoron' (Lidskog et al. 2015, p. 340).

Communication and journalism studies need to similarly engage in broader methodological debates of 'risk' interdependence beyond the nation state to be able (1) to assess and (2) conceptualize the emerging spheres of transnational risk journalism, unfolding as trans-societal axes of 'reflective'—communicative—interdependence (Volkmer 2014) in public discourses of a world society.

This is important as today's transnationally politicized sphere of climate change journalism is situated on the intersection between globalized policies which, given the recent advances of the IPCC, are now becoming the key legitimizing force for national governance and local publics. In this sense, journalists of developed and developing regions—both regions are now fully included in globalized climate change mitigation in United Nations Panels—are called upon to produce the complicated narrative for legitimacy and accountability of globalized policy formations for local publics.

Furthermore, methodological debates need to include scholars from developing regions to understand their specific 'reflexive' perception of globalized risks, such as climate change. The methodological nationalism as a dominant framework of journalism research and—specifically—the adoption of methodological internationalism as a normative approach to international research has been critically assessed (Rantanen 2010, 2013) as an extension of methodological nationalism. We take this argument further and suggest a shift from methodological internationalism to methodological interdependence which is necessary to open up a new 'risk' journalism research field.

We need to assess not only the way how social media, big data and other digital sites set the agenda in newsroom practices but require approaches to identify the individual 'logic' of climate change journalists positioned not in the national boundedness but between a 'local place' and a globalized risk sphere. What is required are approaches which allow to assess the 'reflexive' process of climate change journalism across societies no longer with a national focus but conceptualized as being embedded in transnational interdependent public spheres.

Recently, attempts have been made to address the need for a significant methodological revision of climate change journalism research. Specifically, the Scandinavian scholars Olausson and Berglez suggest a focus on three methodological shifts to transform the entire field of

climate change journalism research: (1) a 'discursive' shift—to move away from mainly quantitative studies and the traditional focus on linear 'content' towards an interrelated methodology relating 'production' and 'content' to the larger 'discourse'; (2) an 'interdisciplinary' shift—to engage in conceptual debates with other disciplines; and (3) an 'international' shift—to reflect 'a more diverse and complex understanding of news reporting globally' (Olausson and Berglez 2014, p. 250).

Our work builds on Olausson and Berglez proposal (2014) of a conceptual shift of climate change journalism research but also on Gibson et al.'s call for a research focus on climate change journalists. Gibson et al. argue that while 'much research has explored the content of global warming and its impact on audiences', only 'a few studies have examined one of the most important *producers* of global warming information— science and environmental journalists' (Gibson et al. 2016, p. 418) which is 'an unfortunate oversight' as journalists have a central position in an epistemic sphere linking 'scientific research, journalism and public knowledge'. Climate change journalism is a new dimension of journalism which shapes 'professional practices and norms of science and environmental journalists' and—so the authors argue—requires more knowledge how these 'norms shape the production of climate change' (Gibson et al. 2016, p. 419).

Taking these arguments further, we propose a 'reflexive' turn through a focus on the journalist who we understand as a 'cosmopolitan actor' within horizons of interconnected 'risk' publicness, enabled by digital communication. As Beck argued 'large scale risks cut across the self-sufficiency of cultures, languages, religions and systems as much as through the national and international agenda of politics' (Beck 2009, p. 60) as 'global risks activate and connect across borders of countries who otherwise don't want to have anything to do with one another' (Beck 2009, p. 61).

A focus on methodological interdependence and a 'reflexive' turn of not only climate change journalism research but also 'risk' journalism scholarship tackles in our view three major transformations in journalistic practice: (1) the journalistic engagement in 'fluid' webs of data, which situate journalistic practice in transnational discourse arenas; (2) the increased involvement of journalists from developing countries who operate as actors in transnationally interdependent spheres; and (3) a focus on subjective journalistic perceptions of the increased globalized interconnected 'risk' dimension.

This book suggests a shift to what we describe as methodological interdependence and a focus on the epistemic sphere of risk 'reflexivity' among journalists by proposing a methodology of 'cosmopolitan relational loops' as an approach to assess the way how journalists engage with the sphere of global risk policy and local risk publics. It is a methodology which is suited for comparative research of the epistemic 'reflexive' dimension of 'risk' journalism across societies.

Based on $n = 51$ qualitative semi-structured interviews with journalists in Pakistan, a rarely investigated South Asian developing region, our study adopts the approach of methodological interdependence to assess the 'reflexive' practice—the trans-societal interdependent spheres in which journalists of English and Urdu language media engage and how they 'perceive' and 'construct' climate change within these specific interdependent 'risk' horizons—and situate themselves in globalized risk discourses. Key questions arise how journalists 'reflexively' operate within such in a globalized communicative 'matrix' of unlimited content spaces, how they select sources, how they perceive and construct 'risk', how they rationalize 'validation' and 'verification' and how they engage with these data fields to 'make sense' of climate change.

Findings show that journalists seem to take on roles of actors to construct the globalized dimension of climate change through their specific engagement in individually constructed discursive 'scales' which we conceptualize as thematic 'arenas', 'actors' and 'communicative spaces'. The conceptual focus on cosmopolitan relational scales and the epistemic 'horizons' of local journalists within such an interconnected globalized 'risk' sphere is understood as an approach of methodological interdependence.

Outcomes of this study show that the construction of climate change is neither situated in the 'local' nor 'global' or 'transnational' sphere but our study reveals the dynamic 'transactional' sphere of continuous interconnectivity with highly diverse climate actors.

Overall, the book aims to contribute to the methodological debate of 'risk' journalism and to the much-needed scholarship of 'inclusive' comparative research in a globalized 'fluid' journalistic terrain—across developed and developing regions.

The study in Pakistan was part of a larger study on 'Journalists as Cosmopolitan Actors', directed by Ingrid Volkmer which constituted a project of the consortium 'Methodological cosmopolitanism in the laboratory of climate change'. Kasim Sharif has conducted the study in

Pakistan. The consortium was funded by a grant from the European Research Council (2012–2014) and directed by Ulrich Beck, University of Munich, until his—much too early—death on 1 January 2015.

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Risk Journalism—In Contexts of Trans-societal Interdependence

The term 'climate change' refers to a variation in the earth's temperature, and global climate policy aims to negotiate the urgent need to restrict the process of planetary warming. While climate change can be caused by natural processes such as solar radiation, mountain building or continental drifts, the term mostly refers to 'anthropogenic climate change', caused by human industrial activities which are drastically changing all types of natural environmental patterns. The Intergovernmental Panel on Climate Change (IPCC), established in 1988, and the 195 countries involved define climate change as 'a change in the state of the climate over time, whether due to natural variability or as a result of human activity'.

However, while the dimension of climate change became a specific focus of journalism research in the USA, Britain and other European countries in the late 1990s, first notions of an emerging globalized environmental crisis already appeared as a journalistic theme in the 1970s. The international publication of the report *Limits to Growth* by the 'Club of Rome', a think tank of scientists of different disciplines as well as NGOs, raised the international attention of policymakers, citizens and journalist concerned with a new type of crisis only visible on a global scale: the industrial pollution producers of the global North, overpopulation in the global South and the worldwide exploitation of natural resources and a prediction of food and water scarcity for the next generations.

The publication of the report and the new 'globalized' perspective on natural resource capacities due to the human destruction of the natural environment resulted in a new perception of environmental 'crisis' among the general public and journalists mainly in Western countries. Journalists in the USA and in Europe began to replace the traditional frames of covering 'the environment', shifting from a focus on 'conservation' of national parks to new critical frames of a new thematic field, such as globalized natural resource politics. This shift was further enhanced by the oil crisis and triggered OPEC oil embargo in 1973 which also revealed the limits of access to unlimited oil capacities to fuel Western industrial growth. Journalists in the USA began to broaden the news agenda and politicize news frames towards the 'four P's': pollution, pesticides, population and people's habits (Schoenfeld et al. 1979, p. 39). All of a sudden, journalists addressed national environmental resource governance, i.e. issues of 'justification', 'accountability' and 'legitimacy' of national environmental policy in the light of first contours of a looming globalized crisis. As is argued at the time (Schoenfeld et al. 1979), journalists are key actors in these debates and need to take on roles as national 'claim maker' and an 'active role in interpretation' as well as in 'constructing social reality' (Schoenfeld et al. 1979, p. 39). This is necessary as the traditional roles and the 'dispersion of reporters by territory, institutionalized specialization and topic mirrors the format of the newspaper itself'. However, environmental news does not fit the 'standard format' where 'unecologically nothing' is 'connected to anything' and readers saw 'the environment in unrelated categories' (Schoenfeld et al. 1979, p. 54). Despite the strong national journalistic focus due to the dominance of national mass media at the time, Schoenfeld's notion of journalists as active 'claim maker' in a scope of a new social reality of a globalized environmental crisis already aimed to conceptualize environmental journalism as a new field where journalists can no longer take on 'neutral' roles but need to be engaged in the definition of a globally interrelated crisis.

A second phase of climate change journalism research began in the 1980s when news media in the USA and the UK focused on the issue of 'global warming' partially caused by the reality of temperature rise and drought in the USA and an increasing public awareness of a globalized environmental perspective that 'global warming' is 'happening'. Throughout this period, journalism research began to mainly assess the coverage in national print media and, as Anderson (2009) notes, only one study included US television networks in the period

between 1990 and 1999 and counted only about 100 news stories about global warming during a time period of nine years (Anderson 2009, p. 167).

In the following years, studies diverted to the content side—to news output—to address the new emphasis on environmental and 'climate change' frames and the thematic agenda of national news content, while only a few related to news values of journalists (e.g. Brossard et al. 2004; Boykoff 2007a, b). However, during this period, journalism research was mainly conducted in the USA and Britain, however, some early studies addressed the broad field of environmental crisis also began to emerge in Australia, New Zealand, Middle East, Asia, Eastern Europe and South Africa (Boykoff and Roberts 2008, p. 39).

The third phase could be described by Neverla's (2008) term of 'climatic turn', a phase where the notion of climate change became the overarching normative paradigm for the incorporation of all types of environmental crises in the journalistic agenda.

However, the term 'climatic turn' can also be understood as a new phase with a focus on the 'coverage' (1) not only of climate 'issues' but also of climate 'action' by NGOs and civic protests. Furthermore, (2) it is a time where journalism research began to address discursive angles as 'sceptics' and 'believers' and the salience of climate change 'values' in an international comparison of national news of Western and a few non-Western countries (e.g. Boyce and Lewis 2009; Painter 2013; Midtun et al. 2015). In addition, this third phase of the 'climatic turn' is character-ized by (3) national journalism research which now assessed the national coverage of the meetings of the U.N. Climate panel conferences which—starting with the U.N. conference in Copenhagen, 2009—gained increas-ing attention in national public spheres and set a new 'globalized' policy agenda in national discourse.

However, the 'climatic turn' cannot only be related to such a the-matic and international broadening of research of national climate change journalism. It is important—and often overlooked in climate journalism debates—that during this period, beginning around 2008, larger shifts in climate governance and policies emerged. The shift might be—at first sight—outside of the field of journalism research, but it is important to realize that these are processes which have began to transform the climate change debate from a national sphere to a new paradigm of globalized interdependence of climate change policy and, thus, constitute impor-tant parameter, new sets of sign posts, for climate change journalism.

Sign posts which demarcate climate change as an interdependent crisis reality. A reality which requires (1) new types of dense global policy measures and (2) journalism within such a globalized public territory.

For example, it is important to consider the stages of global climate governance and 'inclusion' in the different phases of mitigation processes of the International Panel on Climate Change (IPCC) which extend the governance scope the public debate of climate policy including now all types of societies. This phase of 'inclusion' in global climate policy began specifically with the IPCC conference in Copenhagen 2009 where all countries and society types, from democratic to autocratic societies, economically developed and developing, large and small, central and peripheral regions, such as the Marshall Islands, were—never mind their geographic, geopolitical or economic position—equally incorporated into the final accord and held responsible for defending climate change.

These are important shifts in the broader parameter of climate change journalism, indicating an 'inclusive turn' which set the stage for a new transnational discursive sphere of climate change now stretching across all societies as a key terrain of climate change journalism.

Specifically, three dynamics which reset the parameter for climate change journalism are important drivers of new epistemic scopes of trans-societal risk interdependence:

From the 'climatic' turn to the 'inclusive' turn: three dynamics transforming the globalized climate change discourse

(1) The first dynamic relevant to the transformation of the climate change discourse is the full political inclusion of all societies in the policies of the IPCC. This reorientation began in Copenhagen and was fully established on the IPCC meeting in Durban, South Africa, in 2011. While earlier policy frameworks included all types of societies, yet, focused on developed nations in terms of responsibilities in the procedures of climate governance in a two-tier approach, posing commitments mainly on industrialized nations and less on developing nations, the Durban conference changed this policy and inaugurated a new phase of inclusive policy approaches. These triggered an attention to climate change among journalists in developing countries where climate change is emerging as an important policy sector also for sustainable development processes. As has recently been argued—again in political science debates—'poor'

states can be 'green' and, often overlooked in climate change journalism debates, 'non-Western countries' are taking a lead in 'adopting an increasing number of environmental regulations', and some of the poorer countries have even 'exceeded the performance of Western countries in some areas' (Sommerer and Lim 2015, p. 95).

(2) A second characteristic of the 'inclusive' turn are public sphere dynamics. It is important to clearly distinguish between the terms of trans- or international and trans-societal interdependence in these contexts. Digital communication and thematic discourse 'densities' among citizens of different societies enable a climate change discourse which is no longer mainly 'national' but rather thematically focussed on a trans-societal scale. Whereas the terms of trans- and international mainly relate to the traditions of modern nation states (such as in Europe), risk communication dynamics 'flow' today across all society types, including so-called 'failed' states where mobile 'smart' communication enables engagement with all types of risk discourse domains. Such a public dynamic enabled and often driven by social media, and digital interaction enables direct communication with scientists, think tanks, activists, NGOs, etc., across societies within trans-societal 'fields' of deliberation (Volkmer 2014). Furthermore, and these are the larger issues to be addressed here, citizens of all societies engage as globalized 'demos', taking communicative action, and, for example, engage also with journalists. Both citizens as globalized 'demos' and journalists have access to these enlarged dynamics, IPCC debates 'live' on Twitter, YouTube clips and Instagram sites of activists from even the remotest sites of Vietnam. This is a discursive process which enables new types of climate change journalism. Journalists are not only 'claim maker' in national publics as in Schoenfeld's et al. (1979) time but—to take Schoenfeld's term to the next level—have roles as globalized 'actors' to engage with a globalized 'demos' on a trans-societal scale. Specifically as public spheres now operate in a new 'logic' as trans-societal spheres of 'reflective interdependence' of civic discourse, climate change or globalized 'risk' journalism is positioned in a 'horizontal', trans-societal 'matrix of influence' (Volkmer 2014) as a communicative field where journalists as 'actors', interact with 'reflectors' (such as social media debates and 'forwarding' and commenting climate change issues), and 'interlocutors', such as NGOs and activists who engage in risk discourse. In this sense, journalists are (ideally) operating as 'actors' to produce globalized interdependent 'risk' debates.

As an outcome of these two dynamics, a third dynamic is emerging which—also often overlooked in journalism debates—relates to the shifting of public accountability and legitimacy of climate governance.

Specifically, the 'axis of legitimacy' of climate change policy is relevant here. While the research traditions of national climate change journalism assume a focus of journalism frames and a fourth estate role of journalists to critically reflect the legitimacy of national climate change governance, we argue that this axis of legitimacy is shifting, surpassing national governance, and instead has focus on global climate policy as the key domain and a normative 'yardstick' policy to critically reflect all types of regional climate governance processes. This shift towards global policy as a frame for critical reflection of regional processes establishes a new domain of public perceptions of interdependence which constitutes of climate change journalism in a trans-societal spectrum. It should be added that while methodologies in journalism research mainly adopt a national focus, dimensions of fine-lined 'inter-relations' within the shifting axis of legitimacy across developing and developed world regions in the sphere of climate change debates are becoming a new focus in other disciplines, such as in sociology. For example, studies begin to reveal the underlying relations in the transformation processes of states towards an 'environmental state' (Sommerer and Lim 2015) where, as we argue, the shifting axis of legitimacy constitutes an important driver of such a reorientation.

These three intertwined dynamics cause a transformation from 'vertical-' national to 'horizontal-' trans-societal perspectives which overcome the traditional distinction of climate debates of Western and non-Western world regions. This distinction is no longer sufficient at a time where climate change caused by the global North and the industrial practices of developing economies of the global South, simultaneously affects the Monsoon season in Bangladesh, floods in Houston and in Italy and sea level rising in the Netherlands and Indonesia. In such an interdependence of 'risks', climate change implications are no longer an issue of a 'foreign' and 'domestic' news agenda where, as Berglez illustrates, journalists have to apply a specific creativity to 'smuggle' climate issues into the 'media logic' (Berglez 2011) of traditional news genres.

Considering the dynamics outlined above, it seems that the assumption of a territorially bounded national 'risk' arena is already becoming porous—and holes are widening fast—specifically as citizens, the national 'demos', the voting public itself, are no longer mainly nationally 'inward' looking but increasingly aware and are often actively engaging via digital

platforms and social media communication with not only national and international but also highly specific local debates of different climate crisis sites across world regions.

More than a decade ago, it has been argued that boundaries 'that separate territorial states from one another' no longer 'demarcate political spaces based on economic, social, or cultural interests' as each of these 'has its own boundaries that in the face of localization and globalization are less and less compatible with the border of states'. Overall, the 'conception of political space as largely synonymous with territory poses a barrier to theory-building in global politics' (Ferguson and Mansbach 2004, p. 74) and 'national space dissolves as the dominant form of political space' (Albert et al. 2009, p. 18)—just to highlight a few of these debates.

Within such an enlarged non-national 'political space', we are experiencing the density of 'risk' communication on a globalized scale which is intensifying and emerging as peer-to-peer or citizen-to-citizen communication across world regions: 'viral' publics, social media and big data sources contribute to national asymmetries and intensification of disaster, provide 'live' access to mitigation processes and even of U.N. debates which are accessible via *Twitter* real-time feeds anywhere in the world with mobile phone access.

We suggest the term of 'risk journalism' to signify the broader sphere of climate change journalism, situated in such a non-national axis between globalized governance and the legitimacy of local politics. Similar to the traditional fields of 'domestic' and 'foreign' journalism, 'risk journalism' needs to be acknowledged as a third journalistic field. 'Risk journalism' in such a non-national domain relates not only to climate change but—strictly speaking—also to other types of new globalized risks we are facing, ranging from the financial crisis, trans-societal tax evasion which is now in the focus of 'horizontal' journalistic consortia, terrorism and migration which also increasingly evolve on the non-national global-local axis.

A recent analysis of 52 national mainstream newspapers in 28 countries in Africa, Europe, Middle East, North America, Oceania and South America reveals that after a peak of the issue in 2010, the great majority of articles addressing 'Climate Change or Global Warming' in 2016 are published in Europe, followed by North America and Oceania (Boykoff et al. 2016). In comparison, national newspapers in regions that are most affected, such as countries in Africa and Asia which experience either unusual droughts, water scarcity or flooding, are only now beginning to address the issue. Although this survey can only serve as a very general

'topic indicator', it still reveals a huge imbalance of climate change journalism across continents.

It seems that journalists across societies face a twofold dilemma of climate change journalism: (1) to assess the complexity between 'believers' and 'deniers' to negotiate the 'issue' angle in editorial rooms based on the 'right' scientific details required for in-depth coverage of a news 'beat' which does not follow (2) the normal process of 'unfolding' of 'balanced' reporting of providing equal coverage of climate change consensus and critical views. An alternative strategy is, as recent studies reveal, a practice of 'interpretive reporting'. For example, as Brueggemann and Engesser show, journalists of print media in the USA, Germany, Switzerland, the UK and India no longer feel the strict obligation for 'balanced' reporting to include climate change disputes but the inclusion of contradictory information depends on the editorial policy of the news outlet which might not require strict 'balance' (e.g. Brueggemann and Engesser 2017).

Other studies argue for a completely different assessment of climate change journalism and suggest to move away from content analysis of major news outlets to a perception of climate change journalism entirely within a new journalistic 'ecosystem' (Gibson et al. 2016), enabled by interactive digital communication. It is an 'ecosystem' in which 'science and environmental journalists merit scrutiny not only because they occupy a crucial node in the circulation of climate change information, but also because they serve as a sort of "indicator species" with regard to the longterm fate of other beat writers in a quickly changing news ecosystem' (Gibson et al. 2016, p. 418).

Taking these debates further, i.e. from the traditional methodological approach of climate change journalism research as content analysis of the agenda of mainstream media, on the one hand, and the call for a holistic approach of a journalistic 'ecosystem', on the other, we begin our discussion in this chapter through a focus on 'risk' journalism within the context of digitally enabled interconnectivity of public spheres.

The Construction of Climate Change as a 'Globalized Risk'

In general terms, 'risk' relates to 'uncertainties: possibilities, chances, or likelihoods of events, often as consequences of some activity or policy' (Taylor-Goodby and Zinn 2006, p. 1). However, from a 'risk society'

perspective, we need to acknowledge fine-lined distinctions: while 'risk' means the advanced speculation of 'possible future threats', 'catastrophe' is an 'existing threat within a geographically bounded space' (Beck 2009, pp. 9–10) for which causes and effects can be 'determined socially with sufficient precision' (Beck 2009, p. 52). Thus, the category of risk 'signifies the controversial reality of the possible, which must be demarcated from merely speculative possibility' (Beck 2009, p. 52). In brief, climate change is a 'risk' because it is based on the possibility of future catastrophe.

Beck (2010, p. 261) argues that news media 'undoubtedly helped to establish [climate change's] status as a widely recognized global risk' (Beck 2009, p. 69). Similarly, Cottle (2009, p. x) highlights a shift of Western news media, from the infrequent scientific reports to the conflicting coverage of climate change sceptics, and from the climate change controversy to the presentation of climate change as a global risk which has led to a growing public awareness of climate change as a globalized 'risk' in an international spectrum. Already about ten years ago, a Gallup survey showed that 85% of citizens of 128 countries hold the belief that climate change is a global risk. Public perception surveys at the national level indicate the same trend (Gallup 2009). For instance, 58% of the public in the USA and 80% in Canada are of the view that climate change is a globalized risk (Lachapelle et al. 2012). A National Climate Change Adaptation Research Facility (NCCARF), based in Australia, reports on the public perception of climate change risk in the most vulnerable (Australia) and least vulnerable country (UK) and reveals similar trends in both country types in the perception of climate change as globalized risk by 74 and 78% (Reser et al. 2012).

While these surveys mainly relate to national publics, it is important to realize that globalized public engagement not only 'magnifies' risks or enables 'green publics' but also, in today's digital terrains, enables effective 'viral publics' and 'transactional' debates among like-minded citizens in a trans-societal spectrum. These processes are often seen as elements of a national public which is a misconception. Specifically in contexts of climate change, a new type of transactional 'risk' deliberations is emerging in digital spheres which is embedded—and driven—by fine-lined networks among citizens in a transnational spectrum. These processes contribute significantly to the perception of climate change as a globalized interconnected risk.

It is important to realize that such a globalized interconnected risk discourse also reflects different epistemic spheres. These have first been addressed in communication theory as dimensions of imperialism, followed by postcolonialism, or neoliberalism. However, it is a shift towards what Robertson already identified in the early 1990s globalization as 'compression of the world and the intensification of the consciousness of the world as a whole' (Robertson 1992, p. 8) which produces new dimensions of interconnectivity.

It is such an emphasis on relativistic dimensions of 'world consciousness' as a highly fractured sense of 'belonging' to a 'world', perceived very differently 'as such'—depending on local perspectives which also constitute a new field of journalism research within 'fluid' interconnected 'risk' spheres.

The relativistic dimension of 'world consciousness' is further specified in Beck's work who understands this epistemic dimension not as cosmopolitanism—this is an important distinction!—but rather as a locally fractured view of the 'world' as 'cosmopolitanization' (Beck 2009) where 'the world' is perceived from local views through a lens of globalized 'risk' and 'uncertainties'. The interconnectivity of 'risk' and the 'cosmopolitanization' (Beck 2009) produced by 'risk' awareness are, however, also important methodological dimensions when assessing local journalism engaged with globalized risk.

Furthermore, in political science, these world relations have, already two decades ago, been conceptualized as 'distant proximities' as a domain of 'fragmegration' enabling (vertical) interaction between (globalized) fragmentation and (local) community in its relevance for perception of 'uncertainty' and 'ambiguities' in the perception of 'world affairs' (Rosenau 1970). A theoretical approach has informed specific conceptions of civic identity and agency within the parameter of a global civil society (e.g. Kaldor 2003a, b), as drivers of societal transformation of the nation state (Sassen 2006), human rights debates (e.g. Held and McGrew 2007) and—more recently—the field of world politics within a world society (Albert 2016).

National Outlook and Methodological Nationalism in Journalism Research

Despite these nuanced interdisciplinary debates addressing not only globalization but also diverse 'horizontal' processes of fragmentation of globalization which we describe as 'scalings' of globalized interconnectivity,

the interconnectivity of local and globalized spheres is mainly perceived in national perspectives in journalism research. A 'frame' narrows down media reporting of climate change to the national dimension by pointing to nation-specific 'causes and consequences and also its solution in the geographically bounded nation-state' (Berglez et al. 2009, p. 223).

Globalized interconnectivity is addressed through methodologies, developed for the comparative assessment of news media organizations in specific national frames (Hallin and Mancini 2004), the comparison of national journalistic values and practices across countries (Hanitzsch 2009; Cottle 2013; Weaver 2007; Weaver et al. 2017) and a comparison of national/foreign news agenda in a comparison of several countries (Cohen 2013). A second approach to asses globalized interconnectivity in digital journalistic practices of 'networked journalism' perceives journalistic practice as a 'node' within a globalized sphere (Heinrich 2011), identifying new skill sets, required for the practice of 'computational' journalism (Karlson and Stavelin 2014) and data journalism in addition to actor networks (Reese 2015). Even 'news narratives traditionally housed within article story structures can now be broken down into smaller .. units, which can be restructured, reordered, annotated, aggregated, and widely shared' and 'thus, interconnectivity extends even to the area of content structure' (Reese and Shoemaker 2016, p. 394).

Traditional methodologies assessing newsroom practice assess the 'hierarchy of influence' model, defined by Reese and Shoemaker some time ago. This includes a focus on the 'individual' level of news professionals, on 'routines', such as 'workflows', to 'organizational' structures, 'social institutions' and the larger societal structure of news production (Reese and Shoemaker 2016). However, these 'hierarchies' are situated no longer in a national but transnational journalistic sphere where, on a daily basis, journalists reflexively engage with resource 'streams' which involve new 'reflexive' sets of 'hierarchies'. Recent studies begin to address interconnectivity as a core domain by identifying these new 'hierarchies' in contexts of digital 'networked' journalistic practices. For example, a study of journalistic practice in Kuala Lumpur reveals the way how journalists of major news outlets in Malaysia assess digital news resources which Firdaus conceptualizes as a 'glocal network' model of journalistic production (Firdaus 2017).

As we need a methodological debate of journalism not only in an 'international' landscape or 'just' globalized interconnectivity but embedded in an enlarged peer-to-peer interconnected 'fluid' 'data' arena of resources, political agendas, it is specifically the assessment of the

risk journalism sphere which requires not only a new conceptual angle on 'data', 'data points', interfaces and other types of digital networks but a shift towards an epistemic, 'reflexive' approach to assess the way how journalists 'make sense' of and select resources and engage with digital data fields—in other words, how they navigate across their specific 'globalized' data horizons. As has been argued 'the boundaries of states become more porous and states are forced to bargain over and share citizen's loyalties' and 'the dichotomy between the domestic and foreign arenas .. is largely transcended' and 'what is inside and what is "outside" comes to depend on the issue at hand the identity hierarchies in place' (Ferguson and Mansbach 2004, p. 22). Climate change and more broadly journalism dealing with increasing awareness of globalized risk are situated in this 'reflexive axis' managing these new 'hierarchies'.

However, there are various reasons for the dominance of the national focus on media and journalism research even in contexts of international comparison. Various scholars (Curran and Park 2000; Berglez 2008; Rantanen 2010; Volkmer 2012; Esser and Hanitzsch 2012a) argue that the national angle is the most applied and 'standardized' methodology. These 'standardised' procedures also relate to specific content, assess in research as Volkmer (2012) argues that the nation

> still serves as a core unit of analysis, and deeply influences the outcomes of national formations of transnational spheres and often limits empirical approaches in news transnational network terrains where messages such as via Twitter, seamlessly transcend national territories. (p. 112)

Schudson (1978) and Chalaby (2005) attribute methodological nationalism to the emergence of modern journalism in the later half of the nineteenth century, which coincided with the rise of nationalism. As a result, the traditional approach of studying media from the national outlook developed and even continued in today's era of transnationalization of the media remains in the form of national, comparative and cross-national research. In these studies, 'nation-states are equated with media systems' (Rantanen 2013, p. 266) with the exception of few studies that transcend national boundaries (Berglez 2008; Örnebring 2012).

However, a closer look reveals that the 'nation' is represented in specific nuances in media research. Esser and Hanitzsch (2012b) identify cross-national differences 'across diverse settings' and 'evaluate the scope and significance of a certain phenomenon' (Esser and Hanitzsch

2012b, p. 522). They believe that such national focus is deeply embedded in Western 'conceptual thinking and normative assumptions' (Esser and Hanitzsch 2012b, p. 522) which is a dominant paradigm of current media research. According to Livingstone (2003), nations are systematically interrelated and therefore 'comparable' due to some global phenomena (p. 15). This is what Rantanen (2010) and Volkmer (2012) label 'methodological inter-nationalism'. According to Rantanen (2010), this is 'a kind of doubled nationalism, nationalism twice or multiplied over, which compares different nationalisms and implies that true internationalism is presented by representatives of the nation, be these states, governments or media' (2010, p. 27). Thus, the nation state—and not the 'state' which is an important distinction as not all states are 'nation-states'—remains the primary unit of analysis in national, comparative and cross-national media settings.

Opponents of methodological nationalism (Berglez 2008; Cottle 2009; Rantanen 2010; Volkmer 2012; Esser and Hanitzsch 2012a) emphasize the need for a theoretical framework which conceptualizes the complex 'scalar' ecology of communicative structures in a globalized context including the influence of formations of conglomerates (Cottle 2013, p. 2).

However, the phenomenon of digital 'flows' has changed the landscape of communication research towards deterritorialized temporal and spatial communicative public spheres enabled by digital content accessible almost anywhere in the world with Internet access, ranging from Web TV, social media, such as Instagram, Periscope, YouTube, Facebook, Twitter and smartphone applications that are temporal and spatial in nature, and challenge the traditional methodological approaches that confine information flows within the nation state system (Volkmer 2012). Likewise, Berglez (2008) argues that simple categorization of domestic or foreign news is a theoretical illusion as news production is a complex process, involving across the board actoral relationships and dynamic 'flows across national borders and continents' that cannot be conceived with a nation-centric lens (Berglez 2008, p. 845). For Rantanen (2013), media scholars equate nation states with media systems, while globalization challenges such empirical myth on three grounds: (1) media is no longer homogenous, due to the large-scale presence of different forms and formats of local, national, regional and global media within the national territory; (2) national media is not controlled only by the state because of the presence of media moguls who

are investing and merging local news media with global outlets; and (3) media consumption patterns are not limited to the national level; rather, audiences are independent in their choices of selecting local and global, old and new media. In brief, Rantanen (2013) concludes that

> the notion of methodological nationalism prevents us from seeing the ways in which media systems consist of hybrid elements that are global, national and local and that compete with and intervene in one another with no clear or definite boundaries between the domestic and the foreign. (p. 267)

Also addressing this line of thinking, Hanitzsch (2009) observes that the forces of technology (Internet, Web 2.0, mobile communication), the cross-national media ownership and the cross-national exchange of contents and formats 'profoundly changed the fabric of modern media system around the world' (p. 111) and makes the empirical methodology of nationalism obsolete.

Based on these debates, it seems reasonable to argue that media research is imbued with a banal form of methodological nationalism that still delimits the fast-changing news media ecology and communication within a national framework. This underscores the need for a theoretical framework that could systematically study the complex process of news making, involving local and global sources and their complex relationships, new formations of interconnectivity, e.g. the convergence of local and global media.

Methodological Nationalism in Climate Change Journalism

A critical review of climate change journalism research reveals three methodological foci: on news production, news presentation and reception studies.

Debates of news production studies are based on four approaches, i.e. political economy, structuralism, cultural framing and constructionism, guiding climate change news production (see also Hansen 2011; Hansen and Cox 2015). These approaches are derived from Western national contexts such as the USA and UK, who are the pioneers in the study of news media production, and while studies are often country-specific, results are often generalized and—in consequence—uncritically adopted in European and Asian national contexts.

A number of national studies on media coverage of climate change justify the political economy approach by discussing the political and economic pressure of the fossil fuel industry on news media to create uncertainty among the public so as to weaken support for national and global policy action against the coal fuel industry. For example, Gelbspan (2005) argues that an American television editor was threatened with the withdrawal of oil and automobile advertising revenue after he related significant flooding to climate change. Beder (2002) provides a good example of General Electric (GE), the world's largest corporation, which owns NBC television, and is involved in streamlining the business interests with the networks editorial. He notes that the Environmental Protection Agency indicated GE as being responsible for water pollution of the Hudson River (New York) and proposed monetary compensation for the massive clean-up. The company spent US$10–15 million on advertising to destroy the plan, but finally agreed to fund a clean-up operation of the river. Similarly, Antilla's (2005) analysis summarizes the long history of the powerful coal fuel lobby in the USA and their public relation campaigns to manipulate scientific claims by controlling the new media through the political economy approach. Monbiot (2006) points out that BP and Exxon Oil used public relations strategies, involving mainstream media to generate content that mislead the American public and delay the government's carbon tax reform. However, most of these studies are nation-specific and seem to fail to capture the political and economic influence on global actors of climate change such as the UN, NGOs, industrialized countries, multinational corporations and the digital influence of transnational and social media on the climate change news production process.

There are three foci or three 'vertical' dimensions of nationally oriented climate change risk.

(1) Structural Approach and National Research

The structural approach refers to the professional ideology of the news media organizations in the form of news values, balance and objectivity, and the information-gathering routine of journalists that serve to reproduce the content and influence the media coverage of climate change risk. This approach is also the result of methodological nationalism as it is based on the findings and interpretations from Western news media outlets.

News values are an important framework in the domain of climate change coverage. They inform, for example, the criteria for the selection of an event to become news. The structural approach is developed by defining national news media organizations as 'units' of analysis, however, and this is becoming increasingly problematic in contexts of climate change journalism, findings are often generalized. For instance, Harcup and O'Neill's (2001, p. 279) study of British national newspapers provides us with an exhaustive list of Western news values (power elitism, surprise, magnitude, relevance, entertainment, follow-up and the newspaper agenda) for the selection of an event. According to this view, the more the story features these values, the more chance it has to be selected. In short, national news values are taken-for-granted criteria of news selection for global journalism.

Applying this framework to climate change journalism, Anders Hansen (2010) argues that climate change risk rarely meets the demand of the 24-hour news cycle because 'it takes long to develop; there is often uncertainty for years about the causes and wider effects of environmental problems' (p. 96). Furthermore, he argues that climate change becomes 'news' only when it becomes event-centred, for example oil spills, natural disasters and publicity stunts, or when it is characterized by strong visuals (for instance, Al Gore's film *An Inconvenient Truth*), and when it is suited to the 24-hour news cycle. In a similar vein, Miller and Riechert (2000, p. 51) argue that climate change risk only constitutes a risk when it is linked with some event like a protest, disaster or international conference. Conflict is another criterion of national news media that makes climate change risk a newsworthy event. The media coverage of climate change in terms of scandals, environmental protests and international conferences highlights the conflict between environmentalists versus loggers, climate scientists versus climate sceptics, and victim countries versus perpetrator countries. In Cottle's words, 'those environmental concerns that are perceived to be culturally proximate and closer to home rather than those geographically distanced or culturally remote are more likely to be selected as more newsworthy by nationally oriented news organizations and journalists' (Cottle 2013, p. 21). This indicates that national news media gives coverage only to national risks and marginalizes the coverage of universal risks of climate change.

In a different fashion, Boykoff and Boykoff call news values 'first order journalistic norms (personalization, dramatization, and novelty)'. They argue that these norms determine the selection and content of

climate change news (2007, p. 1192). Boykoff and Boykoff's content analysis of US media from 1988 to 2004 proved empirically the influence of these journalistic norms on the content and coverage of climate change risk. They claim that media coverage of climate change from 1988 to 2004 is influenced by these journalist norms. For example, 1988, when

> the novelty of the weather scares, combined with the drama of Thatcher's and Bush's statements, and the personalization of Hansen, a highly regarded scientist meant that this story conformed to the journalistic norms and informational predilections of the newspaper and television news media. (Boykoff and Boykoff 2004, p. 7)

In brief, journalistic norms are the result of nation-specific approaches and have been tested empirically in the framework of methodological nationalism.

(2) National Norms of Objectivity and Balance

Norms of objectivity and balance are considered universal phenomena but are also the result of methodological nationalism. According to Cox, 'objectivity and balance' are the commitment of journalists to provide information that is 'accurate and without reporter bias, and where there is uncertainty or controversy, to balance news stories with statements from all sides of the issue' (2013, p. 155). Cunningham (2003) sees balance as a mean to objectivity. Dunwoody and Peters (1992) argue that balancing is an important tool for journalists who lack scientific education and time constraints. For instance, Boykoff and Boykoff's (2004) quantitative study of US news media from 1988 to 2004 found that 52.7% of news articles are balancing accounts of climate change science by referring to both climate change scientists and the climate sceptics lobby. According to Boykoff (2007a), journalistic norms like objectivity, fairness and balancing (through the provision of equal space to the opposing views of sceptics) create informational bias. Such informational bias challenges the preponderance of evidence for climate change and creates confusion and doubt among the public (Boykoff 2007a, b). Boykoff provides a good example of the news reporting of IPCC's fourth assessment on climate change in *The Washington Post*. The journalist, he points out, first quoted the speech of the Maldives'

president, where he stated that urgent action should be taken to tackle rising sea levels. In order to balance the news story, the journalist quoted an opposing view from a sceptical meteorologist—namely that climate change is natural, and human beings are not responsible for it. Such balancing of news stories, Boykoff argues, is informational bias and creates doubt in readers' minds (Boykoff 2007a).

Others, such as Cottle, also argue for a shift of media coverage from climate consensus to climate change controversy. Cottle claims that within a short span of time, the 'publicized debate within science' has changed 'to a public debate framed by mediated scepticism about scientific claims…' (Cottle 2009, p. ix). He further argues that the 'general orientation of mass media continues to inhibit, dilute, and probably confuse the clarity of understanding needed to tackle climate change' (Cottle 2009, p. x).

In addition, national norms of 'objectivity' guide the construction, publicization and contestation of climate change risk at the national level by different claim makers (scientists, politicians, industry and pressure groups) in the news media as a public arena (Kitsuse and Spector 1973; Lester 2010; Anderson 2010). It describes how claims are constructed, promoted and contested through news media. Importantly, it also explains the reason why some claims get more media attention, coverage and acceptance, while others do not hold the same importance (Anderson 2010, pp. 17–18). However, such perspective allows to identify climate change 'claim-maker' and their claim-making process at the national level without a need to consider the construction, promotion and contestation of climate change as a globalized risk.

It seems reasonable to argue that global media research about climate change news production is still studied from a national point of view, while climate change news production is the by-product of complex, dynamic and interactive actoral actions of local and global nature and transnational flows from old to new stream media and vice versa. This evidences the need for a transnational framework that could conceptualize the multiplex layers of interaction that influence climate change news production.

(3) Representation of National Climate Change News 'Beats'

Again, studies focussing mainly on national contexts assess the way in which climate change news are represented in national outlets document the rise and fall of news media coverage of climate change issues over

the years (Boykoff 2007a, b). A number of media studies have argued that climate change emerged in the public arenas in the mid-1960s and reached its peak in the early 1970s. This was followed by a declining trend in the late 1970s and 1980s, followed by another rise in the late 1980s and early 1990s, complemented by an additional revival in the first decade of the twenty-first century (Brossard et al. 2004; Boykoff 2007a, b, 2008a, b, c; Anderson 2010; Lester 2010; Anderson 2015a, b). A study of Swedish television news media confirmed the findings of previous studies by verifying the gradual rise and fall in media reporting of climate change issues (Djerf-Pierre 2012b). Furthermore, it registers the upward trend of media attention of climate change issues (Djerf-Pierre 2012a) despite political, economic and technological issues. Similarly, a cross-national media study of 40 countries during the period of 1996–2010 revealed the same upward and downward trend of news media and a consistent rise in media attention towards the globalized risk of climate change.

The most used theoretical framework to explain the global rise and fall of media coverage of climate change in the national framework is the 'issue attention cycle model' (Down 1972). It unveils a long history of the ups and downs of media coverage from 1960 to 2010 in the context of both national and cross-national studies (Brossard et al. 2004; Boykoff 2007a, b, 2008a, b, c; Anderson 2010; Lester 2010). According to this model, environmental issues, such as climate change, emerge in a cyclical manner.

The 'pre-problem' stage could be considered as a first phase of climate change reporting, where only some groups and experts are alarmed and the public is widely unaware of the problem. The second phase is the stage of 'alarmed discovery and euphoric enthusiasm', where the public is alarmed about the issue due to series of dramatic events and is enthusiastically involved in resolving it. The third stage is marked by the realization of 'the cost of significant progress' and the much needed sacrifices to solve the issue'. The fourth stage is the 'gradual decline of intense public interest'. The 'post problem' is the final stage, where the concern of the issue changes its centre from the public to the state (Anderson 2010, pp. 20–21). During this stage, the issue 'moves into a prolonged limbo; a twilight realm of lesser attention or spasmodic recurrences of interest' (Down 1972, p. 21). A number of studies conducted over different countries (Trumbo 1996; McComas and Shanahan 1999; Mikami et al. 2002; Brossard et al. 2004) yield the same results and testify to the relevance of the issue attention cycle model 'for identifying and making sense of the different stages in the cycle of media coverage' (Anderson 2010, p. 28).

It should be added here that the three most prominent theoretical frameworks (namely cultivation analysis, agenda setting, framing and persuasion theories) to conceptualize social and political implications of climate change news reporting have their roots in methodological nationalism (Hansen 2011; Hansen and Cox 2015). The first is cultivation theory, which, as argued by Hansen (2015), 'essentially states that heavier viewers of television will be more likely to hold conceptions of the world that are consistent with TV portrayals than lighter viewers' (p. 242). Surprisingly, empirical studies (McComas and Shanahan 1999; Howard-Williams 2011) produced contradictory results, i.e. 'heavy television viewers were less likely to show concern for climate change' (Shanahan et al. 2015). In other words, the absence or marginal representation of climate change issues in the news brings 'culture in reverse' (Besley and Shanahan 2004) or the symbolic annihilation that would lead to a lower concern among heavy viewers (Shanahan et al. 2015, p. 245). An exception is Dahlstrom and Scheufele's study (2010, p. 54), which supports cultivation analysis, as it records a positive association between frequency of watching television and higher concern about the risk of climate change among people. Another study (Holbert et al. 2003) reversed this thesis and argued that it is people's environmental attitude that guides them in the selection of television programmes and news. Similarly, Good (2013) noted that it is viewers' materialism (and not the direct effects of the news media) that makes them less concerned about climate change issues. Shrum and Lee's (2012) empirical study testifies to the link between TV, materialism and environmental concerns. This leads us to argue that 'cultivation analysis' only conceptualizes the public attitude and behaviour in terms of national boundaries, and not from a global perspective.

Agenda setting is the second most applied framework to study the effects of media coverage on public perception of climate change at the nation state level. It has its basis in Cohen's (1963, p. 13) formulation 'that the press may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about'. According to Iyengar and Kinder (2010), the public considers issues to be nationally important if they are prominent in news media coverage (p. 16). Empirical studies conducted within a national framework have proved the strong potential of national news media agenda in setting the public agenda for climate change (Hansen 2010, p. 18; Soroka 2002). In their national study, Iyengar and Kinder (2010)

confirmed the agenda-setting effects of evening news on the audience, but found no evidence of the vividness of news reporting in affecting the public perception of environmental issues like climate change. Ader (1995) and Soroka (2002) claimed that the agenda-setting effects of national news media are stronger in unobtrusive (not easily observed and experienced first-hand) environmental risks like climate change, about which the public has little or no information. Ader (1995) points out that real-world conditions also affect the perception of the public independent of news coverage. Similarly, Anderson (1997) adds that family and friends also affect the public perception about climate change, which is why agenda research should also consider other factors as well. However, Ader's (1995) study affirmed the positive association between national news media and the public by informing us that the greater the amount of media attention to climate change, the greater the degree of influence on the national public:

> When the effects of reality were controlled, the correlation between the media agenda and the public agenda was strengthened. As predicted this study found that real-world conditions do not influence the media or public agendas directly. The public needs the media to tell them how important an issue the environment is. Individuals do not learn this from real-world cues. Also, the media are not effective at determining the importance of this issue from real-world cues. (Ader 1995, pp. 309–310)

Lindahl (1983) highlights another dimension of agenda-setting research, i.e. the effects of the public's opinion on the media agenda, by taking the example of media coverage of nuclear plants in Sweden. In contrast, Gooch (1996) notes 'that personal experience of local environmental problems', 'interpersonal communication' and 'levels of trust upon news sources' have more effect on the public agenda as compared to the press (p. 107). Gooch further suggests a geographical dimension to this, namely that the media may have a stronger impact on public opinion in relation to national/global issues, than in relation to local environmental issues (Anderson 2010, p. 172). It seems reasonable to argue that agenda-setting research in media and climate change has its roots in the nation state model, and its application is tested by using methodological nationalism.

'Framing' is the most used methodology to explain media's effect on the public. Cox (2013, p. 164) perceives, for example, 'media frames as organizing themes that connect different elements of a news story into a

coherent whole'. In other words, media frames can organize the facts of a news story in ways that provide a narrative structure: what the problem is, who is responsible, what is the solution and so on. According to Gitlin (1980), they direct public attention to a particular dimension by following the principle 'of selection, emphasis and presentation' and help the public to interpret according to the presented news format.

Thus, while framing of climate change issues affects public attitude and behaviour in certain direction by emphasizing certain aspects, the success of framing depends on the audience's cognitive schema because people 'are more inclined to pay attention to and accept some of these frames of references over others' (Nisbet and Newman 2015, p. 329). This led to perception studies, which originated in the USA in the 1990s (Kempton 1991) and later spread to European countries followed by Asian countries. The nation state remains the dominant approach of all these perception studies in the form of national and comparative studies, and today in the form of cross-national studies (Whitmarsh 2015).

It can be argued that based on the above discussion, public reception studies are conducted in the national, comparative and cross-national context and only capture the influence of national media on the public by ignoring the influence of other local, regional and transnational media as well as of new stream media.

Furthermore, they fail to conceptualize how media interaction with different human technical and digital actors across the physical and digital scales determines the media discourse of climate change risk, which—overall—shapes the attitude and behaviour of the public towards the globalized risk of climate change.

Digital Spheres and Climate Change Journalism

Recent literature can be categorized into structural, functional, thematic and individualistic according to the methodological approach used. There is no comprehensive framework to conceptualize online activities of climate change actors and their complex dynamic interactions, resulting in the online construction, negotiation, contestation, resolution and communication of climate change risk over news media.

One approach is what we describe as a 'structural' approach. It includes online news sites, the blogosphere and social networking sites (Cox 2013, p. 177). Environmental news services are the most important online source of information for journalists and citizens who

require in-depth information about climate change. These sources provide up-to-date videos, links, images and high-quality content for print, electronic and online sites. ENS, Green Wire, Climate Wire, Climate Central, Envirolink Network and Environmental News Network (Cox 2013, pp. 179–180) are some examples of these sites. In contrast to online news services, the blogosphere is the most researched area of climate change (Cox 2013, p. 180). A blog (or Web log) is 'an online site that is authored by an individual (usually) or collective authors and that posts information or commentary about specific topics. Blogs also feature video and graphics' (Cox 2013, p. 180). Journalists use blogs for sourcing information and in-depth reporting of climate change, whereas environmentalists use them for delivering climate change campaigns. In contrast, climate sceptics use the blogosphere to promote scepticism. Finally, social networking sites allow users to interact with others, post content and receive updates on climate change.

On the contrary, the 'functional' perspective provides insight into the functional dimension of new digital media research on climate change. According to Cox, digital media performs multiple functions, namely providing up-to-date climate change information, recording the observations of scientists, environmentalists and the public on the climate change, documenting public criticism and accountability while mobilizing public support for climate change policies, and triggering micro-volunteering and self-organizing in the public. This online public scale is free from the gate-keeping activities of news media organizations and state interference and accommodates alternative voices like individual citizens, marginalized groups and small non-government organizations. As Carvalho argues, mainstream media marginalizes critical voices (2010a, b, p. 175) in contrast to Web 2.0, which facilitates individuals, groups and organizations' engagement with the problem of climate change (2010a, p. 1). Ryghaug et al. (2011, p. 780) argue that such deliberation offers information and knowledge playing an important role in creating public awareness regarding climate change. For example, *TckTckTck*, a digital climate action network of not-for-profit organizations, raised public awareness about the climate change issue to be discussed in the conference of Copenhagen by mobilizing 11 million people via blogging (Pillay and Maharaj 2010, p. 7).

In contrast, a 'thematic' perspective brings to light the thematic dimension of online construction and communication of the globalized risk of climate change. The first debate is centred on the volume of

online climate change content across the virtual scale (Schäfer 2012, p. 69). According to a German study, people rely more on the Internet than any other news media, like television (Schäfer 2012, p. 69). In support of this, Schäfer reports that in April 2012, an English Google search for 'climate change' would return 377 million hits, exceeding other popular searches such as 'Barack Obama' and 'Kim Kardashian' (287 and 348 million hits, respectively) (Schäfer 2012, p. 6). Similarly, a survey by the Pew Research Centre indicates that climate change is among the top five most used keywords of the Web 2.0 (Pew Research Center 2011, 2012). Schäfer (2012) concludes that new stream media have witnessed a considerable increase in the climate change content over the years.

The 'thematic' perspective revolves around the quality of digital climate change content. It is observed that the content is often poor in quality due to the lack of mainstream scientific sources, and it is increasing addressing uncertainty about climate change among the public (Schäfer 2012, p. 6). An influential study in this respect is Gavin and Marshall's (2011) 'discourse analysis' of Google-searched websites during the international event of COP15, where he found that 29% of websites had sceptical content without any reference to scientific journals (2011, p. 1039). In a similar vein, he notes that online content is 'often long…unstructured, angry or abusive and filled with assertions that would be difficult to cross-check…'. (Gavin 2010, p. 469), and above all that 'the calibre and ton of content is often uninspiring, and can in places descend to playground level' (Gavin 2009, p. 137). Holmes (2009, p. 96) claims that most of the websites with climate sceptic content refer to the scientists funded by coal fuel industry like Exxon Mobil. Although new stream media provides a scale for the public to share their opinions, it is 'not very good at supporting evidence-based, logical deliberation' (Malone and Klein 2007, p. 20). Gavin summarizes this by stating 'that the web perhaps generates more heat than light, its contribution to informed debate being mixed at best, and very unedifying, or even distasteful, at worst' (Gavin 2010, p. 469).

Another important area of digital research is the heated debate between 'cyber optimists' and 'cyber pessimists' on the democratic nature of new stream media as a public sphere of climate change. Cyber optimists believe that new stream media gives freedom to the marginalized voices that are often unheard on traditional mainstream news media (Schäfer 2012). For instance, Carvalho claims that mainstream news media 'muzzle critical voices' (2010b, p. 175), whereas new stream

media 'allows a much wider set of individuals and organizations to express their views in a public forum with a potentially greater reach, resulting in diverse information and knowledge-sharing' (2011, p. 780). For Allan (2004), stream media has the potential to integrate alternative perspectives, contexts and ideological diversity into news reporting, providing users with the means to hear distant voices who would otherwise be marginalized, if not silenced altogether. In contrast, cyber pessimists are of the opinion that new stream media does not trigger political engagement and participation, is influenced by powerful stakeholders and makes it difficult for the layman to assess the quality and credibility of the scientific information available (Schäfer 2012). Gavin (2010) concludes that empirical studies proved that the new stream media is not acting as an 'egalitarian, democratized, alternative and 'separate avenue of communication' on climate change' (p. 459).

Finally, an 'organizational' approach examines the role of different climate change actors such as corporations, political actors and think tanks, scientists, non-government organizations, climate change deniers and the public in the construction and communication of climate change risk over new stream media (Schäfer 2012).

The most important of these actors are powerful and well-funded entities, like political actors and corporations, who—in some cases—put pressure on news media. A number of studies analyse how these powerful actors use public relations campaigning to exploit journalists with press releases, bullying tactics and professional political strategists masquerading as a concerned community (Lester 2010, p. 24). Cox (2006) offers the example of British Petroleum's PR television campaign of the 'man on the street' to build the image of the company as environmentally friendly and promote its future investment in alternative energy sources (p. 376). Current media consumption trends and financial cuts on newspapers in the form of fewer reporters and new technology increase the pressure on newspapers to develop their own version of climate change discourse (Lester 2010, p. 94). Apart from this, the pressure to produce a large number of stories in a short time forces journalists to rely on PR material (Lewis et al. 2008). Lewis et al. (2008, p. 17) state that '19 per cent of newspaper stories and 17 per cent of broadcast stories were 'verifiably derived mainly or wholly from PR material or activities'. About a decade ago, climate change PR campaigns were the fastest growing industry in USA, earning US$1 billion of business in the first five years (Beder 2004, p. 214). The reason behind this was the

aim to protect the industry's green image and deal with climate change opposition. Similarly, Goldenberg (2009, pp. 1–2) argues that 'these guys are spending a billion dollars this year convincing Americans that they are clean, green, cuddly and warm'. These corporations hire a group of citizens or experts to oppose government environmental regulations and introduce policies to enhance corporate profitability Beder (2002, p. 27). They also change public opinion for the acceptance of their market goods and defuse the tension created by environmental groups.

Studies addressing social media activities of other climate change actors such as politicians, corporations and think tanks are limited. A small number of studies in the USA, Australia, Sweden, the Netherlands, Japan and India empirically prove that the state and its institutions 'use offline and online media for information campaigns on climate change to encourage public participation, and as tools in disaster management' (Schäfer 2012, p. 5).

The second most important organizational actors are scientists and scientific bodies, who should be the primary definers of climate change but hold secondary importance in the climate change discourse. Hansen (2000) notes that newspapers and other key players employ scientific data and scientific experts to support their ideological positions and legitimization of their claims (p. 66). Pollack highlights that scientists and scientific bodies have lost their credibility in the domain of climate change, which is an unsettled scientific matter and will remain uncertain. Such uncertainty creates doubt among the public and is amplified by the coal fuel lobby and polluting industries whose interests could be at stake (Pollack 2005, p. 6).

The participation of scientific institutions and climate scientists in the online debate of climate change is evident in the 'climate blog sphere' (Schäfer 2012). According to the website technorati.com (as cited in Schäfer 2012), there are approximately 1400 climate change blogs, while Bentley (as cited in Schäfer 2012) is only able to identify 100 blogs belonging to climate scientists.

The reality is climate scientists have little time for micro-blogging (Bonetta 2009). Moreover, they tend—in some cases—to be unfamiliar with Web 3.0 as a medium and are unlikely to continuously participate in the climate change debate, due to both, the high levels of inaccurate information in circulation and the irrational discourse that it engenders (Bonetta 2007). Their only role is in journal publication, virtual conferencing (O'Neill and Boykoff 2011, p. 243) and dissemination of

scientific information to the public (Bonetta 2009, p. 453) on specific platforms. Although the participation of climate scientists is minimal in the sphere of social media, they still educate the public, including journalists, opinion leaders and activists through, for example, digital content of television and radio, books and magazine articles, and newspapers. Moreover, they enable the public to participate more, debate scientific findings regarding climate change and help to refute climate change scepticism (Schäfer 2012).

Another important actor in climate change politics are NGOs and environmental lobby groups, which as a result of limited resources and a comparatively restricted ability to influence key stakeholders, use social media to mobilize public support (Schäfer 2012, p. 161). For example, in China where news is strongly regulated, national new stream media is the only platform available to climate change NGOs to mobilize public support and awareness about climate change (Schäfer 2012, p. 161). Stein (2009, p. 161) claims that these non-government organizations use social media in four ways. Firstly, to interest parties in their goals, topics and actions; secondly, to get public and media attention; thirdly, to increase their public support and gain publicity for fundraising campaigns; and fourthly, they attempt to change the behaviour of the public and mobilize them to take action in the form of signing online petitions, participating in outdoor protests or sharing viral YouTube videos. NGOs are utilizing the platform of social media in order to develop globally broad climate change networks to address specific issues. A good example of such a network is the Global Campaign for Climate Action, 'which includes approximately 300 NGOs, or the British stopclimatechaos.org, which is used by over 100 groups' (Schäfer 2012). The only missing point is the use of the online sphere of cosmopolitan interconnectivity as a platform for participation and debate regarding issues of climate change and the exchange of information between North (developed countries) and South NGOs (developing countries) to find a solution to the global risk of climate change. As NGOs are less powerful, they use spectacular stunts or demonstrations to gain visibility in news media. They package their information and campaign to suit the textual and visual needs of media organizations (Anderson 2010; Lester 2011). For instance, Greenpeace appealed to news events by presenting images of boats above the barrels of toxic waste being dropped from large cargo ships. However, such events only gain brief media attention, however, do not remain visible long enough to gain public legitimacy and support.

They only serve the role of catalysts and not primary definers (Anderson 2010, p. 53). A good example is Greenpeace's inferior success in legitimatizing its claim in the claim-making process (Hansen 2000, p. 71).

These initiatives gain some attention due to their linkage with developments, events and important public figures in established and legitimate news forums (Anderson 2010). The campaigns involve issues that have already gained media coverage and only succeed if they coincide with political events such as parliamentary debates, government reports, international meetings, and conferences, WTO and treaties (Hansen 1993). Their activity 'helps direct the attention of mass media to aspects and interpretations which might otherwise have gone unnoticed or might have been deliberately glossed over' (Anderson 2010, p. 54). They serve as intelligence reports and have surveillance over environmental policymaking and decision-making developments. In this way, they facilitate journalists by making their tasks easier, because they have no time to monitor such diverse activities (Eyerman and Jamison 1989, p. 113). They also leak information and bring it to the media attention and thus gain legitimacy. In other words, they are the 'information subsidies' for the news media organizations, which are short of time and resources.

These environmental lobby groups sometimes employ celebrities to gain media attention and 'potentially strengthen and mobilize existing support, alert new supporters to the cause and provide a conduit to policymakers' (Lester 2011, p. 157). For example, the Sea Shepherd Conversation Society recruited Bo Derek, as well as Daryl Hannah, to raise awareness and stop the large-scale hunting of wolves in British Columbia. However, Goodman et al. are uncertain about the increase in environmental coverage due to celebrity presence (2008). Thrall et al.'s (2008) study found no connection between the increase of climate change coverage with celebrity stories. Furthermore, celebrities do not necessarily overcome the traditional blockage of news media attention for advocacy groups.

Existing literature indicates furthermore a large-scale presence of climate change denial groups over the digital communication networks. Gavin and Marshall's (2011) discourse analysis of Google-search-based websites identified 29% of websites containing sceptical content (p. 1039). Similarly, Lockwood (2008) found that 4 out of 20 blogs are sceptical in nature. According to McCright and Dunlap (2000, p. 356), there are two active groups of conservative think tanks on the Web 2.0. They are engaged in blogging through their own websites (such

as Cato-at-Liberty and Freedom-Talks.org) as well as guest-posting on ideologically similar websites. In this way they are promoting skepticism through their websites.

Similarly, Holme attributes this large-scale presence of publicly misleading websites and blogs to the funding of ExxonMobil (Holmes 2009, pp. 95–96). Monbiot (2006) argues that these sceptic organizations have human resource management skills and an abundance of resources in enabling the creation of sceptical content. They hire distinguished scholars who have expertise in science and media to mobilize public denial and discourage government inaction. One particular example that he provides is that of Bellamy, a botanist as well as television presenter, who claimed, on the basis of an unidentified resource paper, that glaciers are expanding. Monbiot (2006) also quotes Greenpeace's website, which stated that 137 organizations are being funded by the Exxon oil company. In sum, a large-scale presence of climate denial discourse in digital media is misleading the public and marginalizing the public sphere for effective climate change policy (Ladle et al. 2005, p. 234).

'The public' is another important actor as far as its use of online media for climate change communication is concerned; however, studies have revealed that publics are perceived as a passive actor in environmental issues like climate change because individuals are presented as victims and sufferers and are often marginalized because they lack institutional authority. For Beck (1992), the public is the voice of the latent side effects of climate change as they unveil the risk of climate change: 'therefore people themselves become small, private alternative experts in risks of modernization' (Beck 1992, p. 61).

Cottle's UK study reveals that the ordinary voices form the highest percentage within news involvement. However, resources appear in restricted format as a visual reference, rather than being directly quoted or appearing in live interviews. Moreover, these voices only provide the human side of climate change news stories and become a symbol of climate change effects (Cottle 2000, p. 30). However, Cottle argues that there are few exceptions, where 'an ordinary person manages to escape the cultural conventions of news sentiment, symbolic positioning, and stunted presentational formats to elaborate a form of social rationality "in engaged public discussion"' (Cottle 2000, pp. 43–44).

Digital research is directed towards the effects of online climate change content upon the public's knowledge, awareness and behaviour. Cox (2013) argues that new stream media is the most regularly used

platform to mobilize the public's support for climate change by creating public awareness. Others, such as Arlt et al. (2011), highlight that only few comparative studies are conducted to distinguish the effects of both, mainstream and new stream media, in creating awareness about climate change, and call for more research on the topic.

Likewise, new stream media's effects on public knowledge are also under-researched. Furthermore, it is unknown whether the frequent use of Web 3.0 or the intentional search for climate change increases public knowledge. Zhao's (2009) study found already about a decade ago that the Internet has positive effects on improving the public's knowledge of climate change (see also Eurobarometer 2011). However, Kahlor and Rosenthal's (2009) study found opposite results. Taddicken and Neverla (2011) argue that the intentional use of the digital Web for climate change information increases and improves the public's knowledge of climate change. As far as behavioural effects of new stream media is concerned, it is agreed that they are limited and weak. Taddicken and Neverla's (2011) study shows that behavioural change corresponds to the intentional search by a public for climate change. Arlt et al. (2011) point out that online climate change information only brings public awareness, improving their knowledge, but no change in people's consumption patterns and lifestyle. However, such change can only be witnessed during crises and disasters.

It can be argued that studies based on methodological nationalism provide insight into the actoral influence of different climate change actors over news media, but consider only those actors within a state's geographical boundaries and—in the perspective of today's interdependent risk awareness across societies—it could be argued that studies rarely address the influence of globalized actors and other types of actoral connectivity, such as discursive trans-societal axes of 'reflectors' and 'interlocutors' in a globalized discourse.

The above discussion has outlined key strands of conceptual approaches to digital climate change communication, its volume and content, the conflicting claims about its being a public sphere and broad range of activities of climate change actors over the new media.

However, conceptual and methodological frameworks are required to explain the 'construction' and 'communication' of risk among journalists in trans-societal interdependence.

A shift towards methodological interdependence is required which allows to identify the similar and different horizons of 'risk' journalists'

perception to assess the journalistic sphere in today's advanced sphere of globalized risk.

In consequence, a shift towards the journalist as an 'actor' becomes important and to conceptualize the subjective navigation practices of globalized data 'fields'. We require conceptual frameworks to assess the reflexive 'axis' of combining and 'making sense' of nonlinear flow of climate change information between new and old media and explore the impact of digital communication.

Frameworks are required which allow a specifically focus on complex actoral nonlinear interactions that are trans-societal 'horizontal' and take place across physical and digital scales and also in between these 'scales'. These interactions of 'risk' journalists influence news production, representation and communication and even its reception among the audience. This emphasizes the need of a transnational/supra-national framework that could contribute ontologically, epistemologically and methodologically to climate change journalism research.

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Towards Cosmopolitan Relational 'Scales' of Actoral Interconnectivity

The previous chapter addressed the dimensions of climate change as a globalized risk (Beck 2009), and it is argued that a globalized perspective requires a transnational methodological framework for assessing the new dimensions of interdependent risk journalism. Beck (2008) has stressed the need for cosmopolitan solidarity among different actors, whose relationships and interactions at different levels (from local to global) shape the politics of climate change.

However, the dimension of 'cosmopolitan solidarity' (Beck 2008) is rarely reflected in journalism studies. As journalists take on new roles in communicating contexts of globalized risks, it is necessary to conceptualize the epistemic taxonomies of communicative relations and interactions of journalists within a journalistic 'ecology' of interconnectivity, with actors, citizens, policymakers and publics. Journalistic practice of 'making' sense of these interconnected resources, the way how journalists in their day-to-day practice engage with different 'axes' within such an ecology of interconnectivity, is no longer situated within 'national boundaries', but we require a new terminology which allows to address the 'globalized reach' of specific interconnected 'axes'.

The chapter is divided into six parts. The chapter opens with the historical review of socio-geographical constructions of 'scale'. The second part conceptualizes scales—local, national, regional, global and cosmopolitan 'scales' of interconnectivity—and their role in addressing the

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globalized risk of climate change. The third part proceeds with debates about emerging digital scales as sites for the discourse of global risks such as climate change. The fourth part of this chapter introduces the physico-digital scale of interconnectivity as an alternative means to theorize the transnational dimension of climate change risk. The subsequent section draws upon relational sociology for the construction of the relational scale of interconnectivity by addressing its temporal, actoral and relational dimensions and its merits towards conceptualizing the globalized risk of climate change. The chapter concludes rationalizing the cosmopolitan relational scale of actoral interconnectivity as an approach of methodological interdependence of climate change and risk journalism research.

Conceptualizing 'Scale'

'Scale' is one of the core concepts in geography and social science research, and provides us with an approach 'to carve the world into manageable pieces for the purpose of analysis of no more than handy mental contrivances for ordering the world' (Herod 2010, p. 6).

A good starting point is Saskia Sassen's concept of 'global scalings'. Her focus on 'global dynamics' has resulted in a focus on formations of 'scale' as a dimension of social science research. She argues that 'global dynamics destabilize older hierarchies of scale constituted through the practices and power projects of past eras, with the national scale eventually the preeminent scale' (Sassen 2004, p. 5). Sassen sees alternative scales emerging, such as 'powerful firms', 'global cities' and 'horizontal global civic networks' denationalizing the state (Sassen 2004, p. 6). In her work, 'global scalings' cut across all types of states and constitute an important new conceptual angle to dissolve the normative 'thickness' of the national paradigm in social research (Sassen 2004). 'Scales' crisscross states and—over time—create new types of links across societies and the traditional state order. In her work, she has identified global cities, migration processes, diaspora but also financial markets as globalized 'scales'. She argues that 'the fact that a process or entity is located within the territory of a sovereign state does not mean it is a national process or entity: it might be a localization of the global or a denationalized instance of the national' (Sassen 2007, p. 2). In this sense, global scalings are sub-national or supra-national processes which are normally assigned

to national boundedness; however, the specific globalized interconnected arena of these scalings is overlooked.

Sassen specifically argues that social sciences address either the global or the national scales, overlooking scales of 'connecting' social and economic phenomenon and the 'scalings' emerging beyond such a dichotomous perspective. Sassen notes that 'today's global and denationalizing dynamics cut across institutional hierarchies and across the institutional encasements of territory historically produced by the formation of national states'; however, 'this does not mean that the old hierarchies disappear but rather that novel scalings emerge alongside the old ones and that the former can often trump the latter' (Sassen 2007, p. 6).

The concept of 'global scalings' is important for the methodological debate of digital communication (however, rarely included in conceptual approaches) but specifically for the methodological reorientation of risk journalism research as Sassen's conception enables to map the transformation from transnational to transactoral communication. While methodologies in transnational media communication research have a focus on the nation as the unit of investigation and comparison, the fluidity of digital communication requires an approach to assess the figurations of the 'spatial reach' of digital spheres within a globalized context. For example, the reach of political content, produced by the International Panel on Climate Change (IPCC), may reach citizens in developing regions on social media sites; however, the 'reach' is either measured by national (often representative) research methods or through assessing the rate of page views, social network analysis, etc. Social network analysis tools reflect and visualize the unevenness of 'reach' of a specific site across continents and show specific network and node patterns, situated within the digital transnational space. These patterns of data visualization constitute a first notion of 'scale' as it is visible how highly specific content, such as on climate change issues, is 'liked' or hashtagged by citizens in different countries who are reflected as connection points in data visualization. We could argue that another type of 'scaling' is produced by Facebook who publishes statistics which reveal the comparison of connectivity rates of Facebook not in countries but in large cities around the world. These statistics show Jakarta as the city with most Facebook connections, and this scale continues with cities such as Mexico City, Kuala Lumpur, etc. In this sense, the 'scales' of comparing the most

connected Facebook cities reveal a new insight into the dynamic densities of digital connections which can no longer be measured in traditional national representative comparison. However, what is also needed are insights why citizens relate to this content and how they build their own 'horizons' of climate change issue through their activity in numerous digital networks reaching individuals in Kenya, Pakistan, Fiji and New York.

While attempts are made to adopt the traditional repertoire of communication research, ranging from agenda setting to framing to assess this digital transnational space, there are numerous shortcomings. As these are established models of Western media research, the processes of agenda setting, etc., might be quite different in other, i.e. non-Western, societies. Furthermore, what is required is a 'ground theory' to inquire new formations of digital 'logic' and 'reflexivity' across societies.

We suggest to begin a debate about 'global scalings' and the specific ways how 'scales' as an abstract concept is useful for communication research in a transnational digital spectrum. So a first step is to navigate the broader conceptual frameworks of 'scale' before moving forward and addressing scalar processes as a methodological approach for transnational digital journalism research.

Until the 1980s, 'scales' were theorized from the capital-centric perspective, which pinpoints the emergence of scale to the rise of capitalism. As Smith (1990, p. xv) argues, 'capital produces the real spatial scales that give uneven development its coherence'. Nevertheless, the second wave moved from the capitalistic production of scale to its social construction (Delaney and Leitner 1997). According to this view, 'scale' is structured by social, economic, political and cultural processes. In other words, to better understand scale, researchers should study other social actors besides capitalists (Herod 2010, p. 21).

A third attempt to conceptualize scale took place in the last decade of the twentieth century and continued in the first decade of the twenty-first century. This approach acknowledged specifically the network aspect. Here we refer to the two leading social theorists that articulated the network vision of scale. The first is Cox (1998, p. 2), who conceived dimensions of 'scale' as emerging from social relations among social actors; they connect one scale to another, creating a network. In other words, Cox suggests that scales are not discrete entities; rather, they are changing on a routine basis because of social actions.

In contrast, Brenner (2001) envisioned scale as both a real and a network term. According to Brenner,

> the politics of scale includes not only the production, reconfiguration or contestation of some aspect of sociospatial organization within a relatively bounded geographical arena but also the production, reconfiguration or contestation of particular differentiations, ordering and hierarchies among geographical scales ... [The scaling process concerns not only] the production of differentiated spatial units as such but also more generally their embeddedness and positionalities in relations to a multitude of smaller or larger spatial units within a multi-tiered, hierarchically configured geographical scaffold. (Brenner 2001, pp. 599–600)

Brenner's work defines 'scale' as a micro-entity delimiting the social phenomena on the basis of a spatial and temporal division, but adds also another dimension, i.e. scale as a macro-entity. Such scale, he argues, is comprised of micro-scales and theorizes all social processes that take place among these geographically contained space envelopes. This suggests that scales are intertwined and conceptualizes the social world in terms of a scalar hierarchy.

Taking these debates further, we suggest sets of scales of interconnectivity which allow to regroup social research in order to reveal how social science research is already addressing the broad phenomena of 'scalings'. While Sassen argues that social sciences overlook formation of scalings meandering across societies, it seems that vague formations of 'scalings' have been addressed in local, national, regional and global dimensions and provide a basis for our further discussion.

LOCALIZED SCALES OF INTERCONNECTIVITY

Localized (micro) scales of interconnectivity conceptualize social processes taking place locally. However, as Robertson (1995) argues, in their ambitious pursuit of a macro-sociological view of society, social theorists forget the importance of the micro-sociological or local scale of interconnectivity. In fact, so he argues, social science is more interested to internationalize sociology and less inclined to conduct research from a local perspective. Hence, the local scale is not often taken as an analytic or interpretative scale (Robertson 1995, p. 30).

The early documentation of local scale derives from the work of Giddens (1991), who identifies local scale in his discussion of globalization (p. 64). Writing about globalization, he argues that it 'is the intensification

of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa'. This suggests the separation of local scale from global ones on the basis of temporal and spatial divisions and also underlines the interconnectivity between them. Conversely, Robertson (1995) differentiates the local from the global on the basis of social processes. He posits that local and global processes mutually constitute local and global scales:

> There is widespread tendency to regards this problematic as straight-forwardly involving a polarity, which assumes its most acute form in the claim that we live in a world of local assertions against globalizing trends, a world in which the very idea of locality is sometimes cast as a form of opposition of resistance to the hegemonically global (or one in which the assertion of locality or Gemeinschaft is seen as the pitting of subaltern universals against the hegemonic universal of dominant cultures and /or class … I have instead maintained that globalization—in the broadest sense, the compression of the world—has involved and increasingly involves the creation and the incorporation of locality, processes which themselves largely shape, in turn the compression of the world as a whole. (Robertson 1995, pp. 29–40)

It seems reasonable to argue that the local scale can either be perceived in terms of temporal and spatial differences or aligned with the limited or vastness of social processes that determines whether the scale is local or global.

To narrow the focus of our discussion further, we refer to geography and social theory as both fields equate local scale with the city. Historically, the concept of city evolves from Greek civilization. For early theorists, city is a 'spatial container of a community of citizens' (Herod 2010, p. 91), which could stretch in size from a settlement with few houses to large urban centre. In short, historical approaches consider the city as providing a spatial identity, while later theorists conceptualize cities from a materialist point of view. According to this view, cities are, for example, a mode of production, and it is the increasing capitalism that led to the urbanization of cities (Herod 2010). For instance, Sassen (2001, pp. 3–4) argues that London, New York and Tokyo are global cities because 'they are production, financial and business services hubs, and the market centres of global economy'. This suggests that the city has gone from being considered a local scale to a global scale;

however, Castells (2002) rejects this idea and claims no city is entirely global because all cities have local areas or neighbourhoods ('like Hampstead in London, or Queens in New York') and 'most people in these same cities live local lives' (p. 372). Rather, he conceives the city as a local 'node' structuring worldwide networks:

> cities are] spaces in one network of quasi-simultaneous interaction that brings together processes, people, building, and bits and pieces of local areas, in a global space of interaction.

This illustrates the network vision of city as a scale that connects 'hundreds and thousands of localities on the basis of mass production and mass consumption services' and local societies (Castells 2002, p. 372).

Applying this to debates on the globalized risk of climate change, it can be argued that the city scale (in both the real and the network visions) is a useful framework to provide insight into the local dimension of climate change risk. As Paton and Dunlop (2010) argue, the globalized risk of climate change cannot be handled successfully unless 'the local knowledge and beliefs, local realities, as well as local voices and actions are addressed' (p. 687). Therefore, city as a local scale is the best way to understand the challenges of globalized risk of climate change. Even media and communication scholars could take the city scale as a unit of analysis to explore the local news production of globalized risk of climate change (Rantanen 2007, p. 443).

National Scales of Interconnectivity

The most taken-for-granted approach in social theory is the national scale. This is based on the idea of the 'national community as the terminal unit and boundary condition for the demarcation of problems and phenomena for social science' (Martins 1974, p. 276). Giddens (1973) also refers to the long historic nationalistic trend of social science research and claims that 'the primary unit of sociological analysis has always been and must continue to be, the administratively bounded nation-state' (Giddens 1973, p. 265). In a similar fashion, Smith (1979) claims that most of the conceptual frameworks of the social sciences drive their force from 'nationalist conceptions' and reinforce it one or the other way in the form of methodological nationalism (p. 191). Chernilo (2011) takes 'methodological nationalism' as evidence of 'reductionist

thinking' in social science and argues that it arises when society is equated with the nation state and social change is explained in terms of the nation state:

> Methodological nationalism is found when the nation-state is treated as the natural and necessary representation of the modern society or the equation between the idea of society as social theory's key conceptual reference and the process of historical formation of the nation-state in modernity. The idea of society becomes the all-encompassing presupposition around which all modern social trends are being explicated; the nation-state and the modern society become conceptually undistinguishable. (Chernilo 2011, p. 2)

Furthermore, he claims that methodological nationalism still prevails in the twenty-first-century social science landscape and every social scientist has somehow indulged in methodological nationalism, but no one is ready to admit it. According to these social theorists, it can be argued that the national scale is always equated with the nation state which is only one society type and the nation state is the most taken-for-granted norm for conducting empirical research from the social and media theory perspective.

Wimmer and Schiller's (2002) work is influential in the sense that they explain in more detailed ways the three most common forms of methodological nationalism, namely 'ignorance', 'naturalization' and 'territorial limitation', which are imbued in social science literature. The first one is 'ignorance' in terms of structuring and perceiving social reality according to nation-state principles (pp. 303–304). The second one is 'naturalization' by 'taking national discourses, agendas, loyalties and histories for granted, without problematizing them or making them an object of an analysis in its own right' (p. 304). The final one is 'the territorialization of the social science imaginary and the reduction of the analytical focus to the boundaries of the nation-state' (p. 307). They conclude that these three forms 'are more or less prominent in different fields of [social] enquiry' (Wimmer and Schiller 2002, p. 308). However, the most compact criticism of methodological nationalism is articulated by Beck (2008), who criticizes the national framework of social theory as it prevents making sense of globalized phenomena such as denationalization and transnationalization:

[Methodological nationalism] equates societies with nation-state societies, and sees states and their governments as the cornerstones of a social sciences analysis. It assumes that humanity is naturally divided into a limited number of nations, which on the inside, organize themselves as nation states and, on the outside, set boundaries to distinguish themselves from other nation states…Indeed, the social science stance is rooted in the concept of nation-state. (Beck 2008, pp. 51–52)

Beck also emphasizes the need for a reconceptualization of the current changing social phenomena through the transnational scope of cosmopolitanism. In fact, he warns that if social theory fails to adapt to contemporary change (by overcoming methodological nationalism and developing conceptual tools that go beyond national container models to comprehend the developmental processes of globalization), it would be redundant and obsolete:

This entails that the fundamental concepts of 'modern society' must be re-examined. Household, family, class, social inequality, democracy, power, state, commerce, public, community, justice, law, history, politics must be released from the fetters of methodological nationalism and must be reconceptualised and empirically established within the framework of a cosmopolitan social and political science. (Beck 2008, pp. 53–54)

However, Chernilo (2011) disapproves of Beck's argumentation and declares it to be a scholastic jump from 'nation state' to 'world-risk society' in search of something new and different. He argues that Beck conflates two types of methodological nationalism (theoretical and historical), which emerged from the co-evolution of social theory and nation state in the nineteenth century. In this sense, social theory is challenged by the nation-state approach associated with methodological nationalism:

Theoretical methodological nationalism arises when it is assumed that the deep-seated conceptual structure of the social sciences would have led them to think exclusively from within the national box' [while] the empirical or historical version of methodological nationalism stresses the idea that states and nations have been the major actor in modernity over the past two centuries or so and that modernity's most salient historical empirical trend has been no other than their unification along territorially, normatively and culturally. (Chernilo 2011, pp. 104–105)

In spite of its inherent flaws, Beck's critique of methodological nationalism is still valid for social science research. According to him, the national scale of social science has failed to address the globalized risk of climate change (Beck 2009, p. 166) and constructs it and its side effects in the context of national societies. Such an outlook perceives only those risks which are a threat to one's own society and is least concerned about the risks in other regions. As a result, risk donor countries, which are largely responsible for globalized climate change due to their nationalistic industrial policies of the first modernity, do not take into account the risks and threats affecting the risk recipient countries. Such an approach leads towards a confirmation of the 'non-existence' of the global risk of climate change in risk donor countries. According to Beck, the national scale cannot deal with global risks like climate change, because it does not solve the complex matrix of risk conflicts and inequalities by identifying 'who are the agents of risks and who the victims, who the winners and who the losers' (Beck 2009, p. 171). Furthermore, every categorization of climate change as internal/external or national/transnational cannot help the national researcher come to grip with nonlinear, timeless and spaceless causes and consequences of globalized risk of climate change (Beck 2009, p. 177). In addition, the cultural diversity at a transnational level in the construction and perception of risk cannot be conceptualized by adopting methodological nationalism (Beck 2009, p. 178). Even comparative approaches assessing national risk profiles have failed to analyse the complex 'cross-border interdependencies and interactions that have resulted in the glocalisation of global risks like climate change' (Beck 2009, p. 168).

In brief, social science research tends to conceptualize social phenomena in terms of the national scale and is blind to globalized ones, like climate change, that are the result of transnational flows and complex actoral interconnections across borders and via digital networks and which demand a transnational conceptual framework.

Regional Scales of Interconnectivity

Historically, a region is conceptualized as micro- or meso-region on the basis of natural, cultural and economic space, and is often placed inbetween local and national scales. However, the formation of 'region' across the national territories on the basis of sectorial division of labour (such as the steel-making industry on both sides of the national border)

paved the way for macro-regions that sit inbetween national and global scales. According to Söderbaum (2003), 'macro-regions (world regions), are larger territorial (in contrast to non-territorial) units or sub-systems, between the state and the global system level' (p. 1). We associate our concept of regional scale with the discourse of macro-region(s), 'which is the most common level or object of analysis' (Söderbaum 2003, p. 7) in international theory of relations (Söderbaum 2003). He claims that this scale has failed to grab the attention of social and scientific observers, who are too preoccupied with the national and global scales as set parameter to analyse social phenomena (Söderbaum 2003, p. 1). As a rule, such a scale is organized by complex 'mid-level "triangular" relations' among state and non-state actors (corporations and civil societies), who pursue their political, economic and cultural goals' (Herod 2001, p. 63).

However, Castells (2002, p. 87) confines this scale to the political activities of nation states at the regional level. According to Castells (2002, p. 38), this is a scale where nation states form a network and interact with each other in order to respond to global challenges like climate change. Good examples of regional scale(s) are the European Union, the South Asian Association for Regional Corporation, Organization of Islamic Countries, the South East Asian Nations, etc. Castells' (2008) conceptual framework of the 'network state' is useful in the sense that it unfolds the ad hoc nature of regional scales of interconnectivity where decisions are implemented 'via ad hoc decisions, ushering in sometimes-contradictory rules and institutions, and obscuring and removing the system of political representation from political control' (Castells 2008, p. 88). He pinpoints the problems of political legitimacy, lack of coordination among state and non-state actors, ideological differences between states, and most important of all, the geopolitical motives of states to pursue their self-interests (Castells 2008, p. 88).

Like national and global scales, the regional scale of interconnectivity cannot explain uncertainty, 'casual connections', responsibility and accountability of the globalized risk of climate change because it is bounded by regional boundaries (Beck 2009, pp. 173–176). Here we argue that the failure of SAARC's climate change action plan—a symbol of regional interconnectivity—to deal with the globalized risk of climate change is caused by poor co-ordination among states in the region, an imbalance of powers (India being the most powerful actor), the decentralization of power from national states to the regional government and the implementation of regional decision-making at the national level.

The prime minister of Kenya sums up the failure of the scale of regional interconnectivity to tackle global risk of climate: 'we have failed to communicate climate change to our people, we must and we must, and will, do better in the future' (Godfrey et al. 2012).

GLOBAL SCALES OF INTERCONNECTIVITY

A significant bulk of literature on globalization challenges the national scale of interconnectivity and proposes a global scale of interconnectivity to deal with the globalized risk of climate change (Urry 2000; Sassen 2007; Beck 2009; Castells 2010). Herod (2010) argues that the 'global scale has often been conceptualized as the acme of scales, the one either encompassing all others or sitting above them, and from which there is no hope of disengagement' (p. 247). He argues that this scale is always explained in the binary of local (weak, concrete) versus global (powerful, abstract) and is the most used interpretative frame to analyse cross-border social phenomena. On the other hand, Brenner (1997, p. 147) takes it as a 'hypercomplex', polyscopic and contradictory amalgamation of multiple forms of sociospatial organization, not as a reified, 'territorialized essence'. In brief, globalization literature conceptualizes the global as an abstract, powerful scale, sitting at the top and comprising in itself of all other scales.

Apart from different interpretations of the globalized scale by social theorists, we confine this discussion by referring to two main scales of interconnectivity, namely global governance (Held 2010) and global civil society (Kaldor 2003a, b). Both work in their respective domains and sometimes in a coordinated mode (Castells 2008) to tackle the globalized risk of climate change.

GLOBAL GOVERNANCE SCALE OF INTERCONNECTIVITY

Firstly, we explore the role of global governance in handling globalized risks such as climate change. Castells (2008, p. 38) argues that such a scale emerges out of the inability of nation states to handle global challenges (e.g. global war on terror and globalized risk of climate change). As a result, they form an ad hoc scale of interconnectivity to interact with each other in order to respond to global challenges. He also elaborates the working of this scale in the form of a 'dense network of international institutions and supra-national organizations to deal with global issues'

(Castells 2008, p. 88). He further categorizes the global governance scale into general-purpose scales, like the United Nations, and specialized scales such as NATO (security), IMF and World Bank (financial), and UNEP (environmental issues) (Castells 2008, p. 88).

Held (2010, pp. 21–22) critically evaluates the role of the scale of global governance in addressing climate change and concludes that it has remained ineffective due to poorly coordinated efforts between the various actors (nation states, non-government organizations and international organizations) as well as weak enforcement in the absence of universal law. Although the United Nations—emblematic of global governance with its subsidiary bodies such as the United Nations Framework Convention on Climate Change, the Environmental Management Group and the Centre for Sustainable Development—has made some progress in developing a global consensus regarding the existence of climate change as a pertinent issue, debates over appropriate action are still raging (Karns and Mingst 2004, p. 497). Major divisions between the Northern and Southern Hemispheres have hampered the United Nations' effort to reduce greenhouse gases emissions.

Climate change is a complex issue because 'countries and regions have very different interests in achieving a solution, implying a highly contested distribution of costs and benefits' (Held 2010, p. 231). Moreover, its being local and global at the same time creates a burden of responsibility between international organizations and national governments. In addition, the share of developing countries is historically small as far as global emissions are concerned, so they object restrictions to their development (Held 2010, p. 231).

The Copenhagen Summit of 2009 demonstrates the failure to reach an international agreement regarding the cut-off of GHG emissions (Held 2010, p. 220). The other obstacles facing global governance in addressing climate change include significant representation from developing countries, unequal access to decision-making (Held 2010, p. 208), inequality of resources between developing and developed countries, uncertainty surrounding the cost of policies and questions of participation and deliberation (Held 2010, p. 208). Developing countries (most notably China and India) that generally have limited funds and technology to commit to reducing carbon emissions also criticize the double standards of developed countries, which have achieved sustainable growth at the cost of environmental degradation, and argue that such compliance of reduction in emission of GHG will stall their economic

growth. At the same time, the developed countries are unwilling to share the burden of cost incurred by developing countries in reducing GHG emissions (Held 2010, p. 220). In summary, the inherent problems of global governance have resulted in a failure to address the complexity of the global risks of climate change.

GLOBAL CIVIL SOCIETY AS A SCALE OF INTERCONNECTIVITY

Like global governance, the global civil society is another large scale of globalized interconnectivity available to address global risks such as climate change. Anheier et al. (2001, p. 17) identify three key aspects of global civil society that make it the largest scale of globalized interconnectivity. Firstly, it is composed of a large number of actors, including individuals, organizations, institutions and networks. Secondly, the operational sphere of these actors exists at a transnational level. Thirdly, these actors interact with each other. All of these characteristics validate the claim that global civil society is the largest scale of interconnectivity at a transnational levels. In a similar vein, Kaldor (2003a, b) argues that the global civil society provides a platform through which activists, non-government organizations, neo-liberals, and national and religious groups are interconnected and have the opportunity to participate and deliberate on global issues like climate change.

One significant demonstration of this organized global interconnectivity was evident in the November 1999 large-scale mobilization of massive protests involving some 700 organizations and about 40,000 students, workers, non-government organizations, religious groups and representatives of business and finance in Seattle to stop the third ministerial conference of the World Trade Organization. There was a large outcry against some of the WTO policies, such as the shifting of industries to developing countries, environmental degradation, poor working conditions and exploitation of work (Chandhoke 2002). Such an example reveals the heterogeneous nature of the global civil society as the largest scale of interconnectivity at supra-national levels. Chandhoke (2002) attributes two factors to the emergence of a global civil society as the largest scale of interconnectivity at the transnational level. The first is the moral authority and legitimacy gained by the global civil society due to its claims that it represents the general interest of the people against the power of the states and of the global economy (Chandhoke 2002). The second are information and communication technologies

that enable the global civil society network 'to collect, collate, select, and publicize information on a variety of specialized issues ranging from development disasters, to the environment, to the effect of WTO policies such as patenting, to human rights violations' (Chandhoke 2002, p. 41).

However, Sassen (2008) claims that a global civil society incorporates both digital and non-digital spaces of interconnectivity. She points out that global civil society is a new form of 'assemblage' between the national and global levels, providing an opportunity for individuals, activists and also organizations to become part of a global public space due to 'new technologies, decentralized access, interconnectivity, and simultaneity of transactions' (Sassen 2008, p. 66).

Anheier and Themudo (2002) declare the large scale of cosmopolitan interconnectivity to be a new social world, comprised of 'networks, coalitions, partnerships and social movements' (p. 213). In sum, 'the global civil society is a vast, interconnected, and multilayered social space that comprises many hundreds of self-directing or non-governmental institutions and ways of life, which initiates chains of interactions linking the local, regional and planetary orders' (Keane 2001, pp. 23–24). This definition highlights the interconnectivity of non-government organizations, which are the most representative form of global civil society compared with other actors such as networks of religious and political activists and anti-globalization movements (Chandhoke 2002). According to the United Nations Charter, a non-government organization is

> a non-profit entity whose members are citizens or associations of citizens in one or more countries and whose activities are determined by the collective will of its members in response to the needs of the members of one or more communities with which the NGOs cooperates. (Simmons 1998, p. 83)

Prominent examples are the International Red Cross, CARE, Oxfam and World Vision. A good example of non-government organizations' interconnectivity is evident in the global campaign launched by 1000 transnational non-government organizations coordinated through the Internet against the stockpiling and the export of landmines and putting pressure on transnational governments. As a result of this pressure, a treaty banning landmines was signed in 1997 (Chandhoke 2002, pp. 37–41). Another good example of cosmopolitan interconnectivity of non-government organizations is the Climate Action Network (CAN), a group of more

than 850 NGOs in 90 countries that work 'to promote government and individual action to limit human-induced climate change to ecologically sustainable levels' (Climate and Development Knowledge Network 2012).

According to the Union of International Associations database, there were approximately 56,000 international non-government organizations in 2010 compared to 22,200 in 1990 (Anheier et al. 2012, p. 19). However, there are few examples of organized global interconnectivity among non-government organizations. Even when present, such global interconnectivity is loose and often invokes a clash of interests among non-government organizations. Fischer (2006) criticizes the ideal of non-government organizations as a scale of globalized interconnectivity on the basis of inequality between northern and southern non-government organizations. According to Fischer, these organizations are predominantly of northern origin and have more access to 'finance, media and qualified staff' (Fischer 2006, p. 10). As a result, they dominate over non-government organizations of the global South and export their own concepts for implementation to developing countries. Such a weak form of globalized interconnectivity fails to develop a consensus and exchange of information between northern and southern non-government organizations, which is needed to attend to the global risk of climate change. Moreover, global interconnectivity is more evident in the network of operational non-government organizations (which design and implement developmental projects) rather than in the network of advocacy of non-government organizations (Salamon 1994, p. 111). The most pressing need is for globalized interconnectivity, comprising local, national and international non-government organizations via digital and non-digital networks. Only through such a system can we develop a process for the proper use of resources, reduce the clash of interests and improve the efficiency of non-government organizations in regard to transnational environment issues like climate change.

Cosmopolitan Scale of Interconnectivity

Beck (2009) conceptualizes the cosmopolitan scale of interconnectivity to deal with global risks like climate change as arising from 'the traumatic experiences of global risks that threaten everyone's existence and can unite human beings of different skin colour, religion, nationality,

location, pasts and futures if not recognition' (Beck 2009, p. 56). This recognition of the reality of the threat, he argues, fosters cosmopolitan solidarity irrespective of different cultural perceptions of global conflict and risk. Such cosmopolitan interconnectivity seeps through different cultures, languages, religions and 'nation-states' and in doing so changes the priorities of warring parties, groups, camps and nations, creating a context of global action (Beck 2009, p. 60). Beck highlights three features of cosmopolitan interconnectivity, namely the linking of 'universal and particular', 'similar and dissimilar' and 'global and local':

> Cosmopolitanization is a nonlinear, dialectical process in which the universal and the particular, the similar and dissimilar, the global and the local are to be conceived, not as cultural polarities, but as interconnected and reciprocally interpenetrating principles. (Beck 2008, p. 73)

In conclusion, the cosmopolitan scale is constructed on five basic principles: (1) an awareness of our interdependence and common fate in relation to the global risks and crises that blur both identities (us and them) and boundaries (the national and the international); (2) a recognition of cultural and identity difference; (3) cosmopolitan empathy; (4) the acceptance of a global society without borders; and (5) a cosmopolitan approach comprised of 'local, national, ethnic, religious and cosmopolitan cultures and traditions' (Beck 2008, p. 7). The missing dimension of the cosmopolitan scale is the presence of digital networks, which are the result of information and communication technologies and have blurred the boundaries of time and space, 'creating a new form of public interconnectivity' (Volkmer 2012, p. 116). Beck is a social theorist and not a media theorist, and as such, his conceptual framework of cosmopolitan interconnectivity does not pay much attention to the global media and communication as scales of interconnectivity that shapes a new dimension of 'cosmopolitan empathy'.

Overall, it can be argued that early social theorists proposed different physical scales to address different dimensions of the globalized risk of climate change. However, it was the later phase of social theory which, being aware of the rise of information and then network society, added the dimension of digital scale(s) of interconnectivity to study global phenomena, such as climate change.

Digital Scales of Interconnectivity

Apart from physical scale(s), digital communication enables digital scale(s) of interconnectivity across societies which require further attention in communication and journalism research.

Following Castells (2009), digital scales are constructed 'around networks activated by microelectronics based digitally processed information and communication technologies' (p. 24). All of our core economic, communicative and cultural activities are organized around these global networks: for instance, networks comprising of global financial markets, 'global networks of science and technology; global media; and global interactive networks of communication' (Castells 2009, p. 25). Hannam et al. (2006) refer to networks as informational and virtual scale(s) due to the way in which they enable high-speed transmission of information. An important characteristic of the digital scale(s) is its disconnectedness from the boundaries of geographical time-space as highlighted by Giddens (1991), Harvey (1990) and Castells (2009). Giddens' (1991) concept of time-space distanciation suggests that information and communication technologies have a universalized space and time and have stretched relationships between the local and the distant (pp. 63–65). On the other hand, Harvey's notion of time and space compression identifies the role of information and communication technologies, having increased the speed of time, in annihilating the concept of space and distance (1990, p. 241). These two scholars suggest the role of information and communication technologies in the timeless and spaceless scale(s) of digital interconnectivity. However, a detailed discussion of the timeless time and space of flows comes from the influential work of Castells. He differentiates digital scales from physical scales on the basis of spatial and temporal dimensions. According to Castells (2009), a physical scale is characterized by social practices that take place simultaneously and with continuity, whereas the hallmark of digital scale is 'the space of flows refers to the technological and organizational possibility of practicing simultaneity without contiguity. It also refers to the possibility of asynchronous interaction in chosen time, at a distance' (Castells 2009, p. 34).

The dimension of time constitutes for Castells a sequence of practices. He argues that physical scales are regulated by biological time translated into bureaucratic time and are used to assign tasks and order to every moment of life (for example, industrial work and commercial

transactions). In contrast, he contends that digital scales 'annihilate time by negating sequencing on one hand by compressing time' (e.g. of processing of global financial transactions in nanoseconds) (Castells 2013, p. 35) and 'by blurring the sequence of social practice, including past, present and future in a random order, like in the electronic hypertext of Web 2.0' on the other hand (Castells 2013, p. 35). In summary, he documents the shift from physical to digital scale in terms of fixed spaces to space of flows and from biological time to timeless time.

Specifically, Web 3.0 has proven to be an important scale of cosmopolitan interconnectivity for the climate change debate enabling direct and simultaneous involvement of a number of stakeholders—scientists, policymakers, industry and non-government organizations—who compete with each other, through social media, in order to establish their particular perspective on the issue (Anderson 2009, p. 166). This online public scale is free from the gate-keeping activities of news media organizations and state interference, and accommodates alternative voices like individual citizens, marginalized groups and small non-government organizations. To this end, Carvalho maintains that traditional media marginalizes critical voices (2010b, p. 175) in contrast to Web 3.0, which facilitates individuals, groups and organizations in deliberating the problem of climate change (2010a, p. 1). Ryghaug et al. (2011, p. 780) argue that such deliberation gives birth to new kind of information and knowledge, playing an important role in creating public awareness regarding climate change.

For example, TckTckTck (a network of more than 400 non-profit organizations under the umbrella of GCCA) raised public awareness about the climate change issues to be discussed on the conference in Copenhagen by mobilizing 11 million people via blogging (Pillay and Maharaj 2010, p. 7). Furthermore, YouTube channels and 'live' coverage of the proceedings of the meetings of the IPCC on YouTube, Twitter and other social media sites further build 'ad hoc' scales of civic connectivity across societies.

Secondly, these processes improve public knowledge and understanding. For example, the Eurobarometer (2011, pp. 19–23) surveyed 1300 individuals across 12 European countries and found that extensive usage of Web 2.0 improves public knowledge of the causes and effects of climate change.

The media sphere is another important scale of interconnectivity at the transnational level.

Being an important scale of globalized interconnectivity, media faces many challenges in terms of addressing climate change. The first was about two decades ago, the large-scale political and economic influences factors that shape this sphere of cosmopolitan interconnectivity. For instance, McChesney (1999) mentions:

> the core structural factors that influence the nature of media content include the overall pursuit of profit, the size of the firm, the amount of direct and indirect competition facing the firm and the nature of that competition, the degree of horizontal and vertical integration, the influence of advertising, the specific interests of media owners and managers. (1999, p. 31)

The second challenge comes from the routine practices of journalism, such as deadlines, spacing and placement of news, dramatization, simplicity, novelty, authority-based sources, individualization and episodic framing instead of thematic framing. Journalists' norms, values, culture and education represent the third challenge facing the communicative sphere of globalized media. Dunwoody and Peters (1992) claim that American journalists are 'less likely to have majored in science or math than is the average U.S. resident' (p. 208). Climate scientist Malcolm Hughes (as cited in Boykoff 2007) claims that an information gap exists between journalists and scientists, a problem that is only made worse by the routine simplification of complex scientific findings by media outlets. Scientists present the results of their hypotheses with a great deal of caution and acknowledgement of fallibility, which the news media then translate into statements of what would appear to be absolute certainty (Weingart et al. 2000, p. 274). The fourth most important challenge to the communicative sphere of cosmopolitan interconnectivity is journalists' and editors' lack of knowledge, yet, increasing interest in climate change science in developing countries. Harbinson et al. (2006) considered this lack of awareness a decade ago which is now shifting the given new global climate governance policy framework to limited access to quality information, lack of financial resources and editorial priority of issues like crime, poverty and violence (p. 5). Overall, it can be argued that climate change journalism requires new approaches to cover global risk no longer for a national public but a public stretching across diverse 'scales' across all societies.

Physico-digital Scales of Interconnectivity

Apart from the 'binary' division of physical and digitals scales on the basis of temporal and spatial dimensions, there are some approaches (such as Urry 2007; Sassen 2008 and Volkmer 2014) who are concerned with the emerging of epistemic interconnectivity, merging 'physical' and digital scales. In other words, these approaches address the 'reflexivity' of interconnectivity and conceptualize what Robertson called some time ago 'world consciousness'—a dimension which is today structured along subjectively chosen, highly specific 'scales' of digital connections integrating the subjective 'place' and digital interaction as an intertwined conceptual component. This is important as such a perspective allows a focus on the 'reflexivity' of the subject, producing specific scalar 'horizons' of interaction across digital landscapes.

Hannam, Sheller and Urry addressed interconnected mobilities already a decade ago as a useful framework to understand the nature of physico-digital scale(s). They criticize the sedentary approach for its prescription of fixed spatial units (such as local, regional or national) as the basic unit of analysis for social science research and propose alternative scales of spaceless flows. Such scales are based on the hypothesis that everything is 'on the move' from humans to materials. Such movement is not confined to physical mobility in the form of large-scale movements of people, objects, capital and information (Hannam et al. 2006). Rather, it includes also technical mobilities, such as planes, trains, ships, cars and other transport vehicles (Urry 2007, p. 198), that aid physical mobilities, and above all digital mobilities, which comprise all types of communication devices and platforms (Urry 2007, p. 221). Mobilities are interlinked and create physico-digital scales of interconnectivity that organizes the intermittent flow of people, material and immaterial objects from physical to digital scales and vice versa. He concludes that Physico-digital scale(s) are hybrid systems 'that combine objects, technologies, and socialites, and out of those distinct [physio-digital scales] are produced and reproduced' (Urry 2007, p. 221). In brief, Urry highlights the role of physical, technical and digital mobilities for the conceptual construction of physico-digitals scale(s).

In contrast, Sassen (2008) conceptualizes a range of novel scale(s) of globalized interconnectivity. For her, these are the result of the

'capabilities' and 'organizing logic' of national and international institutions and 'tipping points' of history. She uses the example of the Forest Watch Network as a physico-digital scale of interconnectivity, where the local information regarding the abuses of the forests passes from local actors to the global office through digital networks. It is a good example of a local/global 'interaction between placeless digital networks and deeply localized actors/users' (Sassen 2008, p. 66). In this way, a new scale of interconnectivity is constructed which is both digital and non-digital at the same time and which 'partly inhabits specific sub-national spaces and partly gets constituted as a variety of somewhat specialized or partial global publics' (Sassen 2008, p. 66).

In addition, the concept of 'reflexive' public spheres (Volkmer 2014) suggests new dimensions of deliberation between subjective 'place' and 'horizons' of digital communication. The proposed dimensions of 'network centrality', public assemblage and 'centrality of networks' identify the direct and shifting links between digital communication and 'place'. Volkmer first identifies sub-scales of media and Web 3.0 into a supra-scale of digital interconnectivity by referring to the online reappearance of 'traditional media forms over social media … [for example] as news feeds on Facebook, as retweets on Twitter, and on dedicated channels sites of YouTube and other video platforms' (Volkmer 2014, p. 142). Second, she details the threefold process of 'intensification', 'acceleration' and 'dialogical connectedness' that structures the physico-digital scale of interconnectivity (Volkmer 2014, p. 142). These processes are organized by 'actors', 'connectors' and 'interlocutors'. An 'actor', she argues, is a resource of information, for example NGOs' websites, social media and Google. A 'connector' accelerates the process of spread of information, for example, by uploading content on YouTube, sharing on Facebook and retweeting on Twitter; an 'interlocutor re-negotiates through contextualization and provides access to a wider interdependent public' (Volkmer 2014, p. 144), for example satellite channels of Al Jazeera, BBC, etc. Her example is Ghana Live TV, 'a platform which streams live television content from television channels' (Volkmer 2014, p. 142) and uses Facebook to target the African diaspora living across the world. She concludes that spheres of interconnectivity are not linear, not national or transnational, but emerge as 'scalar' processes of reflective interdependence.

RATIONALIZING THE COSMOPOLITAN RELATIONAL SCALE OF ACTORAL INTERCONNECTIVITY

In view of the complex globalized risk of climate change and the limitations of the national outlook and methodological nationalism to conceptualize trans-societal 'scalar' interdependence, and taking into account other alternative transnational frameworks for conceptualizing 'scalings' as globalizing structures in social theory, in the last part of this chapter, we propose the cosmopolitan actoral relational scale of interconnectivity as a framework to conceptualize the globalized risk of climate change. It is based on the following assumptions, which constitute a first step towards conceptualizing our model of cosmopolitan actoral relational modes of interconnectivity relevant to climate change journalism research. It allows to assess the way in which 'risk' journalists engage in actoral interaction across digital scopes to set the agenda of journalistic practice in diverse contexts of different societies. It is this focus which allows to assess the 'depth', the 'logic' of the local journalistic perception of globalized risks, the fine-lined local and individual construction of climate change and the related larger political and ethical values journalistic practice.

Based on this discussion, we argue that the cosmopolitan risk of climate change is produced, constructed, negotiated, contested, debated and addressed by supra-national cosmopolitan actoral relational scales of interconnectivity, which is comprised of diverse actoral interactions and relational scales. The term 'actoral interactions' includes different interactive scales of local and global, supra-national or sub-national, individual 'civic' or institutional. Actoral interactions could take any form. They might be 'reflexive', intended or unintended, intense or weak, emotional or strategic, conventional or unconventional, institutional or individual, digital or non-digital, human or non-human, material or non-material. A relational scale might be a physical place (local, national, regional, global) or a digital space (Web 3.0 and transnational media) or combination of both in the form of physico-digital relational scale.

Based on these assumptions, we suggest to assess globalized risk of climate change as a methodological framework of 'cosmopolitan actoral rational interactivism' where the unit of analysis is actoral interactions.

Thus, the cosmopolitan relational scale is formed by complex, dynamic, nonlinear, timeless and spaceless actoral interactions that take

place within and between the physical and digital relational scales and together structure the cosmopolitan scale of interconnectivity. Therefore, the cosmopolitan relational scale allows to conceptualize the different dimensions—production, construction, negotiation, contestation and resolution—of the globalized risk of climate change.

Applying this framework helps us to conceptualize the different debates of media and climate change research and address a number of questions: Why is the news media not reporting climate change risk on a priority basis? Why is there episodic rise and fall in the news coverage of climate change over the years across the globe? Why is the news media playing a negative role in creating climate change uncertainty among the public? Why does the media sometimes amplify the risk while at other times de-amplify the risk of climate change? How do different actors construct, publicize and contest climate change risk through the news media? Why do some actors get more media attention? How do the images of nature shape and influence the news media's visualization and interpretation of climate change discourses? How can news media increase public awareness and concern about the climate change? How can it reduce the uncertainty associated with the explicit risk of climate change? How can news media develop public consensus about the globalized risk of climate change? How can news media shape the policy of national governments? What role does media can play in implementing climate change mitigation and adaption policies? The answers to these and a number of other questions relate to the relational interaction of a journalist with other human, technological and digital actors that shape news production, presentation and its reception among the audience. The approach of cosmopolitan relational scale allows to conceptualize these relational practices.

This chapter has drawn upon the concept of the physical, digital and relational scales of interconnectivity from the socio-geographical scale discourses and has proposed the 'cosmopolitan relational scale of actoral interconnectivity' to conceptualize the media debates of globalized risk of climate change. The next chapter will further narrow this study's research scope by focusing on local journalists of developing countries like Pakistan from the theoretical lens of the cosmopolitan relational scale of actoral interconnectivity.

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Pakistan, a Glocalized Context for Global Media Climate Change Research

Diverting from the traditional dichotomy of national versus transnational media, from a focus on the nation state towards actoral connectivity across societies and from a methodological research dichotomy of 'linear' vs networked media (e.g. Cottle 2013), this study concentrates on a less investigated South Asian country, Pakistan. Pakistan—even though being a low-income country and being continuously challenged by all kind of crises—cannot 'only' be reduced to these economical or conflict strata but we need to begin to assess developing regions in a new perspective. The following section reveals that Pakistan can be considered as a glocal site where diverse 'scalar' dimensions reveal a specific 'cosmopolitan relational model of actoral interconnectivity'. This chapter sets the stage for the study of specific actors, journalists, which follows in Chapter 5.

This chapter is divided into five sections: (1) the local reality of the globalized risk of climate change in Pakistan, (2) public awareness of climate change in Pakistan, (3) the glocal actoral landscape of Pakistan, (4) the glocal media spheres of Pakistan and (5) the climate change media research gap in Pakistan. Overall, these provide a justification for choosing Pakistan as an ideal site to develop a transnational and transdisciplinary model for the re-conceptualization of debates of media and climate change scholarship in a trans-societal context.

Local Reality of the Globalized Risk of Climate Change in Pakistan

South Asia is a geographically diverse region; its terrain ranges from high mountains to delta islands, from wetlands to deserts and from tropical forests to scrublands. This region is densely populated and a victim of climate-induced disasters, such as floods, drought, melting glaciers, rising sea levels and earthquakes. Additionally, the region is also experiencing changing weather patterns like unusual rainfall, intense cold and extreme heat, and above all a stretching of seasons, like summer in winter and vice versa. Human activities—agriculture, urbanization and industrialization—are the main cause of this widespread regional climate change (Salman 2010).

Pakistan is no exception and is facing natural disasters, like other states in the South Asian region, for instance, glacier melting in Gilgit-Baltistan and northern areas; floods in Punjab, Sindh and Khyber Pakhtunkhwa; drought in Sindh and Balochistan; and rising sea levels in the coastal belt of Sindh and Balochistan over the last two decades. These climatic changes in Pakistan are caused by human factors, including population explosion, rapid industrialization, deforestation and exploitation of natural resources (Salman 2010). According to a PINCC report (2003), carbon emissions—from the industrial, energy, residential and agricultural sectors and from commercial activities, developmental projects and transportation—are human factors contributing to climatic change in Pakistan (pp. 20–32). Globally speaking, Pakistan contributes 0.8% of greenhouse emissions and is ranked 135 in the list of global emitters (Khan et al. 2011, p. 13). According to the World Bank data portal, Pakistan shares only 0.9 of global carbon emissions (World Bank 2015a). As far as sectorial contribution is concerned, the energy sector constitutes 50% of greenhouse gas emissions in Pakistan, followed by the agriculture sector (39%) and the industrial sector (6%). Despite its low share of global emissions, Pakistan is experiencing the most severe effects of climate change. Pakistan ranked third among countries most affected by climate changes, according to German Watch's Global Climate Risk Index for 2012 (Kreft and Eckstein 2014).

The impact of climate change is observed in almost every geographical region of Pakistan. For instance, Balochistan, a mountainous region near the Iranian border, experienced long-term drought due to very little rainfall; only a few districts had partial rainfall. These conditions reduce the

productivity of crops, affect rangelands, forests and deep water levels, and increase wildlife and livestock mortality. These effects may cause reduced income for farmers, unemployment, high prices of food and an increased rate of crimes and migration (Shafiq and Kakar 2007, pp. 660–662).

Pakistan has also felt the effects of rising temperatures (from 25 to 35 degrees Celsius) which caused glacier melting in Gilgit-Baltistan which is close to the Karakorum mountains and floods in northern areas, such as in KPK, the Khyber Pakhtunkhwa province), in Punjab and Sindh. The floods of 2010 killed around 2000 people and affected 18 million individuals in different parts of KPK, southern Punjab and Sindh. They left 11 million people homeless, destroyed thousands of hectares of cultivated land and crops, damaged infrastructure, irrigation systems and roads, and killed 1.2 million heads of livestock. Pakistan suffered damages amounting to $10 billion. The area affected by the 2010 flood was 1.2 million acres in KPK, 1.2 million acres in Balochistan, 3.7 million acres in Punjab and 4.3 million acres in Sindh (Malik et al. 2010, pp. 62–69). In 2011, floods affected the Sindh and Balochistan provinces again. According to the reports, they killed 520 people, more than 1180 people were injured, and agriculture including crops, livestock, fisheries, and poultry experienced heavy losses, resulting in an estimated loss of US$ 1840.3 (Sikander et al. 2014). Similarly, Sindh, Balochistan and Punjab were hit by the 2012 flood, which affected 4.8 million people, 14,270 villages, 1.1 million acres of crops and over 465,000 houses (Sikander et al. 2014). Additionally, climate change also affects wildlife habitats. Particular species of birds and animals are becoming rarer as they are migrating from their local habitats due to fragile ecosystems caused by human-induced climatic changes (Salman 2010).

Likewise, climate change disturbed the hydrological cycle in Pakistan, resulting in a water shortage across the country. According to global risk analytics research report (Maplecroft 2010), Pakistan ranked seventh on the list of countries affected by water scarcity. Pakistan's current annual water availability is 1000 cubic metres per person (Yu et al. 2013). Therefore, not only is Pakistan a water-stressed country—it has less than 1700 cubic metres of annual water supply per person—but the country is also on the brink of physical water scarcity, which begins when water supplies fall below 1000 cubic metres per person annually ('Pakistan at war with climate change', *The Nation* 2014). The Indus River is expected to have less water over time due to glacier reduction in the greater Himalayan mountain range (Xu et al. 2009). Pakistan's irrigation

systems (based on the Indus River) depend on glacial melting from the Hindukush–Karakorum–Himalaya ranges for approximately 50% run-off (Winiger et al. 2005). Initial increase in run-offs due to climate change and its effects on the mountains are expected to be followed by a decrease in water availability. In other words, 'significant fluctuations in snow and ice melt will likely result in periodic excessive (short- to medium-term) or insufficient (long-term) water supplies' (Xu et al. 2009).

Additionally, rising sea levels on the coastlines of Sindh and Gwadar are affecting coastal agriculture, forestry and biodiversity, and are causing damage to mangroves, sea life, coral reefs and coastal lagoons (Rasul et al. 2012). In a similar vein, Farooqi and colleagues (2005) argue:

> Pakistan, least affected by sea level rise, would face the loss of the mangrove forests which are the source of fuel wood and food to local inhabitants and breeding ground for 90 percent of Pakistan shrimp, its main fisheries export. (Farooqi et al. 2005)

In summary, the scientific literature—by local and foreign scholars—juxtaposes Pakistan as a low contributor of global emissions but at the same time, the most affected country by global climate change. Arguably, this scenario will further aggravate the disparity in social and economic indicators of human development index and ultimately lead to political instability, law and order situation, external conflicts with neighbouring countries over water resources, displacement of local people and global mass migration.

Public Awareness and Climate Change in Pakistan

Citizens are the direct victims of climatic changes, specifically in the form of human and material losses. Their perception of climatic changes can play an important role in developing local climate change policies and their effective implementation. In recent years, Pakistan endured the adverse effects of climate change through natural disasters (floods, droughts), rising temperatures and rising sea levels, changing weather patterns and unusual storms.

Despite these severe implications, people in Pakistan have approached these events as routine matters, leaving the issue of climate change unnoticed and unobserved. Even in the presence of advanced information technologies, the public will still turn a 'deaf ear' to changing climatic

patterns (Rathor 2014). The Pew Global Attitudes survey (Pew Research Center 2007) showed about a decade ago that residents of developed countries are more aware of climatic changes than those of developing countries like Pakistan, Indonesia, Nigeria and Egypt (for instance, public awareness in Japan was 99% at the time while in Pakistan it was only 12%) (Pew Research Center 2007). Even the level of awareness in similar developing countries like Indonesia (43%), Malaysia (46%) and India (57%) is higher than Pakistan (41%) (Kim 2011).

In the Climate Asia Report (2014), 50% of respondents were not aware of the term 'climate change'; 51% associated it with the decrease in rainfall; and about 72% admitted to feeling the effects of climate change with the increase in temperature (Zaheer and Colom 2014). This suggests that the people in Pakistan are not fully aware of climate change and its repercussions. The reasoning behind this difference in awareness is that the citizens of other nations are better informed about climate change and more motivated to join awareness, mitigation and adaptation campaigns launched by their respective governments and civil society organizations.

In contrast, the local population in Pakistan may not be well educated, not well informed and may hold little interest in socio-economic issues that shape their lives (Whitmarsh 2005). Additionally, their perception is shaped by their local customs and traditions. For example, Pakistan's natural disasters (like hurricanes, floods and famine) are perceived as the work of nature and are not linked with human activities, but rather associated with religion. This further compounds to people's low perception of climate change.

Perhaps most importantly, the public perception of climate change is also shaped by media attention to this phenomenon. For example, public awareness in Australia increased in 2011, when Australian media politicized climate change issues (Reser et al. 2012). Conversely, Pakistan demonstrates little awareness of climate change due to poor media coverage, and the priority given to other issues like politics, the economy and terrorism. Pakistani media still considers climate change as a low-priority issue, which has not been politicized and is therefore not in the spotlight (Rathor 2014). For example, in the aftermath of the catastrophic 2010 floods, Pakistani media (and specifically electronic media) has started giving coverage to this disaster but the coverage was only event-oriented, with no follow-ups and—above all not—only a breaking news narrative which was not linked to larger scopes of climatic changes (Yousaf et al. 2013).

It is obvious that coverage of this type is not adequate to enhance public awareness of climate change.

Another contributing factor is the large portion of the population living in rural areas of 62% (World Bank 2015b) who have limited access to mainstream and new stream media. This hampers the flow of climate change information to the broader society, leading to a poor understanding of climatic changes. Consequently, though Pakistani citizens are facing serious threats from global climatic change, they have no understanding of the term, of its scientific reasons or its overall effects.

In sum, Pakistanis have scanty knowledge of climate change due to illiteracy, preoccupation with other immediate social problems, being influenced by cultural norms and traditions that equate climate change as natural and not human phenomena and above all limited access to means of information such as government, scientific community, non-governmental organizations, media and Internet.

ACTORAL LANDSCAPE OF CLIMATE CHANGE IN PAKISTAN

However, it is important to realize that Pakistan is a playground of different local and global, state and non-state actors, whose complex relationships shape the local dynamics of cultural politics of climate change. In this section, we will spotlight the different stakeholders in climate change, namely NGOs/INGOs, environmentalists, international bodies, scientific experts, corporations, mainstream news media and social media and their role in the local 'politics of climate change' (Giddens 2009).

Climate change is an ongoing challenge for Pakistan but it retains a low priority on the political and news agenda, one eclipsed by terrorism, the energy crisis and the economy. A state, dominated by issues of terrorism, sectarian violence, and energy and water crises is not capable of focusing on long-term environmental threats (Friedman 2013). Other factors also influence Pakistan's poor response, including inadequate funds to finance and research adaptation and mitigation plans, lack of required knowledge for policymakers about climate change, few hi-tech resources to handle climate change risks (Friedman 2013), and inconsistency in policy and policy implementation. For instance, the Nawaz government abolished the Climate Change Ministry, established by the previous government and also reduced the annual budget for climate change and environmental protection by 62%. Due to this policy reversal, Pakistan faced a loss of $5.2 billion annually and reduced foreign investments (Iqbal 2013).

In January 2015, the Nawaz government restored the Climate Change Ministry due to the—at the time—forthcoming United Nations conference on climate change in Paris (Gah 2015)—a process which clearly indicates the new centrality of global climate change governance.

The majority of Pakistanis (72%) have no confidence in the government's response to climatic challenges (Zaheer and Colom 2014). The government plays no role in initiating awareness programmes for the local communities to enlighten them about climate change and ways to combat it (Khan 2014). However, the government has taken some small steps: for example, it has undertaken a number of projects on climate change with the help of donor agencies, NGOs and developed countries. Unfortunately, there is no communication about these projects to the public through the media, which is an important tool of climate change communication. This suggests an informational gap between the state, media and public on climate change issues, which can be attributed to the state's secrecy.

Pakistan, being influenced by global bodies like the UN, the World Bank and the WTO, demonstrated international commitment to climate change by signing the Kyoto Protocol in 2005. This, and the floods of 2010, moved the government to establish a ministry to deal with climate change threats in April 2012, and its efforts culminated in the form of a National Climate Change Policy, which was officially launched in February 2013 (A. A. Khan 2011). It constitutes the first-ever comprehensive policy document for climate-resilient development. The policy's goal is 'to ensure that climate change is mainstreamed in the economically and socially vulnerable sectors of the economy and to steer Pakistan towards climate-resilient development' (Government of Pakistan, Ministry of Climate Change 2012). It spells out ten policy objectives, namely sustained economic growth by addressing climate change challenges; integrating the policy with other national policies; gender-sensitive adaptation and cost-effective mitigation against climate change; developing food, water and energy security in Pakistan; minimizing the risk of extreme weather events; strengthening climate change response coordination and decision-making processes; using national and international financial opportunities for climate change projects; attracting investment in climate change adaptation through economic incentives; increasing the awareness, skills and capacity of authorities to deal with climate change risks, and natural resources conservation and sustainability (Government of Pakistan, Ministry of Climate Change 2012).

The policy is divided into climate change adaptation and mitigation sections. For mitigation, the policy document lists policy measures that broadly cover infrastructure needs, strategies, management paradigms, legislation, capacity building, response mechanisms and research. For example, for water resources-related adaptation, the policy suggests 'early rehabilitation, remodelling and upgrade of the existing irrigation infrastructure in the country to make it resilient to climate change-related extreme events' (Government of Pakistan, Ministry of Climate Change 2012, p. 4). In agriculture, one policy measure recommends improving crop productivity per unit of land and per unit of water by 'increasing the efficiency of various agricultural inputs, in particular irrigation water' (Government of Pakistan, Ministry of Climate Change 2012, p. 7).

The mitigation focus areas include energy, energy conservation and efficiency, transport and town planning among others, with policy measures for each focus area. Apart from this, the policy also focuses on capacity building of state institutions and raising public awareness (National Climate Change Policy 2012). The policy states that the government will develop action plans to implement the policy. This exercise will be replicated by government departments for cross-sectorial needs and by provincial governments. The climate change policy also required implementation committees at the federal and provincial levels to ensure effective implementation and revision of the policy at five-year intervals (National Climate Change Policy 2012, p. 37).

Mumtaz (2014) highlighted the inherent flaws of the national climate change policy. First, it fails to distinguish between short-term and long-term policies. Second, it requires coordination among various departments of state so that they may form a comprehensive action plan. Third, it lacks active engagement of all stakeholders. Fourth, the policy is not supported by empirical data and puts forth alternatives that are not concrete and implementable in Pakistan. Fifth, the policies neglect the realities of the implementation processes. Sixth, the continuous shifting of climate change issues from federal to provincial lists and vice versa has reduced its effectiveness. Khan (2012, pp. 5–8) argues that recommendations of the policy are general and not specific. Like previous policies, no implementing procedures are presented; the document addresses awareness building but it fails to stress civil engagement and community participation. Finally, it does not highlight the role of national media in the cultural politics of climate change.

A government representative points out that the policy was approved in September 2012, but six months after its launch, there was a bizarre lull in activity from the ministry, which indicated that action on policy measures might not eventuate. Unfortunately, the policy was also curtailed by the austerity drive of the Pakistan Muslim League Nawaz government, which came to power in May 2013. The ministry was converted into a 'division' and put under the Cabinet division. Its development funds were also slashed ('Climate Change: Cut in budget scuttles mitigation efforts', *The Express Tribune* 2013). By July 2013, five months after the launch, the all-important provincial governments were still not in a position to implement the policy (Naeem 2013, February 27). Up until April 2014, the provinces had not passed their own versions of anti-climate change bills (Saeed 2014). Further, the narrow technical knowledge of bureaucrats who act as high-level managers in the Climate Change Ministry also delayed the effective implementation of climate change policies.

The current trend is to ensure all stakeholders are on board. The technocratic approach must be incorporated into the process of climate change adaptation and mitigation, and institutional capacity must be advanced along with capacity building of vulnerable communities (Syed 2011, pp. 89–91).

From the above discussion, it seems reasonable to argue that the state of Pakistan is not playing its due role to handle the local challenges of global climatic changes, and it is being steered by global actors. Furthermore, the national policy is based on a global policy of climate change and has failed to integrate local approaches, coordination with different stakeholders and effective use of mass media platforms. As a result, the government's performance regarding the handling of local climatic changes is far from satisfactory.

The NGO Sector and Climate Change

Non-governmental organizations play a growing role in global climate change awareness, adaptation and mitigation efforts. They are now included in global climate change negotiations, which are usually dominated by governments (Carpenter 2001). In Pakistan, NGOs are considered to be non-profit and public welfare organizations that operate in the private sector. Their contribution to education, health, poverty, water,

gender and environmental issues is significant. They can be categorized based on research, advocacy and service delivery.

Climate change is a new subject for the government of Pakistan. The country has experienced an increase in climate-induced disasters in recent years and lacks funds and expertise to counter national climate challenges. Consequently, Pakistan looks to national and international NGOs for financial and skills-related assistance in dealing with climate change. There are several NGOs working on climate adaptation, service delivery, awareness campaigns and research in Pakistan. Their role is to assist the government in climate change projects. Some NGOs are also working on community-based interventions that deal with building the public's resilience to climate change. A few of them are engaged in environmental impact assessments, capacity-building workshops and training government officials, journalists or civil society members, resolving disputes and managing cross-border environmental issues, producing cost-effective environmental solutions and providing environmental technical assistance.

For instance, Oxfam Novib—the Dutch arm of Oxfam International—is a good example of advocacy aiming to mobilize communities to build climate resilience and pressure government to act, whereas Leadership for Environment and Development (LEAD) Pakistan, an Islamabad-based NGO, has been heavily involved in tackling climate change in Pakistan and sustainable development. The hard-core objectives of the organization are 'research and initiating policy engagement, developing capacity building and training programmes for increased stakeholder engagement, creating and managing partnerships and multi-stakeholder networks, and designing mitigation and adaptation models and frameworks' (LEAD Pakistan 2008). Additionally, LEAD has worked closely with the government of Pakistan in policy engagement and knowledge networking, and supported Pakistan's case in international negotiations and forums at home (LEAD Pakistan 2008).

Likewise, the Sustainable Development Policy Institute (SDPI) has long worked on environmental and sustainability issues in Pakistan. It encourages the implementation of climate change policies, procedures, and rules and regulations in order to attain the goal of sustainable development. Furthermore, it is a platform of collaboration between state and civil society actors. Additionally, it publishes research reports on climate change in Pakistan and communicates through media to the public and policymakers in the form of conferences, seminars, lectures and curriculum development initiatives (SDPI 2008, 2011a, b, c, 2013).

Similarly, the World Wildlife Fund (WWF) aims to ensure a harmonious and stable environment for humans, which can be achieved by preventing the degradation of earth's natural environment. It is concerned with climate change, endangered species, pollution, forests, biodiversity and water. The WWF conducted some notable campaigns to preserve nature and projects on capacity building and cost-effective adaptation plans. They also conduct conservation work through the Global Programme Framework, which includes biodiversity and human footprint meta-goals (WWF, n.d.).

In similar manner, the International Union for the Conservation of Nature (IUCN) also focuses on conserving nature, handling environmental challenges and providing solutions to problems related to environment and climate. It deals with areas of climate change associated with sustainable development (International Union for Conservation of Nature 2012). IUCN also worked with UNEP in a joint project (WDPA) to maintain up-to-date information on marine and terrestrial areas for a wide range of conservation and development activities. IUCN's Species Survival Commission (SSC) protects areas for conservation of their biological diversity. They maintain an idea of ecosystem based on integrated climate change adaptation and promote the resilience of livelihood, reducing the effects of natural disasters, contributing to the capacity building of civil society and government institutions, and the sustainable management and conservation of biodiversity (International Union for Conservation of Nature, n.d.). IUCN's commission on Education and Communication is working to establish a communication strategy to spread key messages and to develop brand-appropriate products (IUCN, n.d.).

Conversely, EvK2CNR, the Italian mountain research organization, is mostly working on environmental and management issues in parks. Additionally, some of its interventions have a meaningful outcome for climate change adaptation and mitigation efforts, such as providing alternative livelihoods for the local forest communities. EvK2CNR also facilitates the visits of international scientists from Europe to study glacial activity in the Karakorum Mountains and collaborate with the Pakistan Meteorological Department, the Water and Power Development Authority, the Global Change Impact Studies Centre and the climate change division. This enables a transfer of skills and technology to Pakistani researchers, aiding their understanding of the local effects of climate change and building a domestic body of scientific data and knowledge on climate change effects (Naeem 2013, June 24). In

September 2013, the EvK2CNR organized a scientific conference in Islamabad on Karakorum resources and climate change in which speakers from several countries discussed their research on glaciers, water and mountain ecosystems (EvK2CNR 2013).

In contrast, CARE (Cooperative for Relief and Assistance Everywhere) is engaged in advocating local climate change mitigation policies, including promoting early warning systems, evacuation plans, supporting reforestation, providing technical equipment and information, and working in collaboration with local governments to reduce pollution. To support pro-environment lifestyles, the organization has built and maintained clean water systems and latrines, and provided education about hygiene and waterborne diseases, tasks which aim to reduce the risks of water-related diseases (Care 2015). To ensure food security, it works with local communities to assist them in producing food that is more nutritious and developing better agricultural and environmental skills.

The outline above reveals that different local and international non-government organizations work independently or in collaboration with the Climate Change Ministry, for the research, advocacy and service delivery domain of climate change subject to the nature of foreign funding. However, their role in climate change efforts is not promising, owing to corruption, their limitation to the areas most funded by global organizations, lack of coordination and ineffective human resource management, and proper utilization of media as channel for mass communication.

ENVIRONMENTALISTS AND CLIMATE CHANGE

Environmentalists are an active civil society lobby in Pakistan, even though they might not always be successful in curbing excesses against the environment. Environmental activism is mostly limited to deforestation, urban planning and wildlife conservation. These efforts somewhat supplement the overall efforts against climate change. But environmentalists play little to no role in climate change except for the campaign to restore the Climate Change Ministry launched by an environmental activist in collaboration with the Purple Women's movement (Gah 2015). Similarly, an environmentalist has worked on natural resources and forest conservation through community engagement with government authorities. An environmentalist and public health advocate has conducted several projects that focus on raising awareness about water conservation,

green spaces and energy efficiency, indirectly tapping into the climate change adaptation and mitigation sectors.

The Pakistan Environmentalist Association is another platform intended to gather environmentalists to contribute to the conservation, restoration and sustainable development of Pakistan's environment. It conducts seminars, conferences and exhibitions to support interaction between environmentalists at the national and international level. In addition to its many commitments, it participated in the 'multi-stakeholder policy dialogue on e-waste management' conference organized by the United Nations Environment Programme in Japan, 2012. It also drafted the environment policy of Pakistan's political party Tareek Insaaf (PEA 2010). In brief, environmental activists are performing their role but they are limited in number, and the media is not covering their activities.

INTERNATIONAL BODIES AND CLIMATE CHANGE

A number of international bodies have played a role in Pakistan's climate change threats. The most prominent of them is the United Nations Development Fund (UNDP), which has been actively working with the government of Pakistan to build capacity for climate change mitigation and adaptation, sustainable energy solutions and protecting Pakistan's ecosystems (United Nations Development Program Pakistan 2013a, b). The UNDP has been focusing on Khyber Pakhtunkhwa and Gilgit-Baltistan especially.

The UNDP claims that its climate change goals are in line with the National Climate Change Policy and are unanimous with the development agenda of the country. UNDP's climate change projects are focused on sustainable energy, water management and ecosystem protection.

UNDP is undertaking a project in Gilgit-Baltistan named 'Reducing Risk and Vulnerabilities from Glacial Lake Outburst Floods'. The project has assisted in the construction of energy efficient houses in the Sindh province and is working with local people for the protection and preservation of ecosystems ('Pakistan, Reducing Risk and Vulnerabilities from Glacial Lake Outburst Floods', UNDP, n.d.). For this particular project, the UNDP claims to have worked with the government in drafting 'policy guidelines and strengthening of institutional capacity to prevent climate change-induced glacial lake outburst floods' in northern

Pakistan; it has also attempted to raise awareness by installing early warning systems for the community at large (Pakistan, Reducing Risk and Vulnerabilities from Glacial Lake Outburst Floods, UNDP, n.d.). Additionally, the UNDP's sustainable land management project 'aims to combat land degradation and desertification in Pakistan in order to protect and restore degraded ecosystems and essential ecosystem services that are key to reducing poverty' (UNDP 2013c).

The World Meteorological Organization has been a vocal advocate encouraging governments to act against climate change. The organization has had Pakistani members and office bearers in the past. It was also one of the first international organizations to link Pakistan's 2010 floods with global warming and climate change (Gronewold 2010). WMO has also been supporting Pakistan's efforts against climate change (WMO 2011). Similarly, the Asian Development Bank approved a project for Pakistan to determine the potential for carbon capture and storage (Asian Development Bank 2014).

UN-Habitat is also providing technical assistance to Pakistan for managing environmental issues, handling disasters like floods and drought, and mitigation plans. It has contributed to earthquake-resistant reconstruction in the earthquake-affected districts of Kashmir and KPK, and has also strengthened training and technical assistance for earthquake-resilient construction and public awareness. Further, UN-Habitat has provided US$60 million for shelter, water, sanitation, hygiene, and land and community restoration, assisting people in self-recovery and the reconstruction of community infrastructure (*Pakistan Settlements Flood Recovery Project*, UN-Habitat, n.d.).

The above literature reveals that NGOs/INGOs, international bodies and environmentalists each play their role in the localized politics of climate change within their set orbits.

SCIENTIFIC EXPERTS AND CLIMATE CHANGE

As a country prone to climate-related calamities, Pakistani climate change experts have a responsibility to speak on national and international platforms about the risks Pakistan faces from climate change. Currently, climate change experts play a limited role in local debates. They are also ineffective because they are few in number, lack specialization, have no research funds and a non-independent status, working instead for the government, NGOs, regional organizations or donor agencies. Mostly, Pakistani experts tend to endorse and mimic the

international climate change debate. They predominantly agree with the scientific consensus that climate change is happening and global warming is most likely occurring due to human activities. They identify climatic changes like floods, earthquakes, drought, rising sea levels and the extinction of species, explaining its causes and developing policy recommendations. Unfortunately, the volume of their research is very low compared to international experts conducting research on climate change in Pakistan (R. S. Khan 2011).

It is unfair to deny experts' role in climate change issues. In 2010, when Pakistan was hit by an international-scale natural disaster, the floods that inundated the country and caused deaths and internal mass displacement, Pakistani experts were able to capture the world's attention about Pakistan's climate change vulnerabilities (R. S. Khan 2011). Pakistani experts have also contributed to reports prepared by the IPCC, which relies on hundreds of scientists from around the world for its scientific reporting on climate change. They have also played a role in formulating the national climate change policy (Naeem 2013, September 29).

As a point of comparison, experts from regional countries such as India and Bangladesh have almost always actively fought for their country's stance at international climate negotiations and leveraged the risks climate change poses to their respective countries by appealing for direct international funding for climate change projects. Conversely, Pakistani experts, perhaps deterred by the entrenched bureaucratic nature of governmental climate change dealings, have failed to assist in developing institutional capacities to get similar funding or to establish Pakistan as a country that requires the world's attention for its vulnerability to climate change threats (Shaikh and Tunio 2013).

In this scenario, there is a need for an integrated and comprehensive approach in which experts from all sectors exchange information and share their research findings and policy papers on mainstream and social media. These practices may eventually contribute towards better mitigation, adaptation and resilience to climate change.

Industrial Corporations and Climate Change

The scientific community considers industrial activities as a major factor contributing to global warming and climate change. As scientific bodies and governments ring alarm bells about the planet's future, some industries have also started to prepare, although the response might be different in different countries and across different industries (Jeswani et al. 2008).

A number of national and multinational corporations felt compelled to alter their business practices by adopting corporate sustainability management, the sole purpose of which is to introduce strategies for mitigation, adaptation and resilience building (Murninghan 2010).

Yet, in Pakistan, all three industrial sectors, energy and transportation, are producing full greenhouse gas emissions. They are constrained by a lack of awareness and financial resources, absence of policies and regulations, lack of expertise and non-availability of technology and above all societal pressure (Jeswani et al. 2008, p. 57). Jeswani et al. found that more than 75% of Pakistani companies could be classified as either 'indifferent' or 'beginner' to climate change reduction strategies and implementative measures as compared with just 30% of UK companies. 'Indifferent' companies in Pakistan were mostly from the textile, cement, paper, food and drink, and chemical sectors (Jeswani et al. 2008). Additionally, in contrast to active UK companies (30%), only 5% of Pakistani industry is adopting and implementing climate change measures.

In Pakistan, industrial regulations regarding the environment are more focused on water pollution including water wastes and water emissions; there is no concern about greenhouse gas emissions and energy efficiency standards in the corporate sector (Jeswani 2009). The National Climate Change Policy includes corporate representatives in the implementation committees it has mandated. Further, there are regulatory checks on local companies to curb emissions and encourage them to be sensitive to climate change. Pakistan also has low greenhouse gas emissions, so corporations might also argue against government regulation on this basis (Jeswani 2009).

In sum, corporations may appear to be positively inclined towards environmentally friendly measures and efforts, to which they devote some energy. However, it remains the case that big corporations who seem to compromise the environment to pursue their financial and corporate agendas which ultimately contributes to climate change.

Mainstream News Media and Climate Change in Pakistan

Media are an important tool in framing climate change issues, shaping public opinion and building public pressure on elected governments to tackle this issue (Burgess 1990). According to a 2014 BBC report (Zaheer and Colom 2014), television, radio programmes and newspapers

are the main sources of climate change information for rural and urban audiences.

This role is absent in the Pakistani media who are not ready to give due importance to local climate change issues; rather, they consider the issue part of the foreign agenda. The main focus of Pakistani media is politics, the economy, conflicts, terrorism and sensational news (Afzal 2012). Consequently, people are not aware of climate change issues, and the government remains slack in implementing climate change policies.

The 2010, floods were a major news item for Pakistani mainstream media, but the local coverage was not continued, and instead of becoming environmental or climate change news, it would be more accurately categorized as 'disaster coverage'. However, this example demonstrates that Pakistani mainstream media are willing to report on climate-related stories if they appear as big, breaking news. Another example is the 2014 malnutrition and famine crisis in the Thar Desert in Sindh, where children were reported to be dying due to malnutrition. The story broke as a humanitarian tragedy. The media descended on the affected areas and political inefficiencies were uncovered. The story became politicized, revealing a struggle between the central and the Sindh government; then, it slowly lost its appeal and was removed from the news cycle. This is not to say that all news coverage was uncritical, but that mainstream news media (print and TV) dealt with the issue as an 'event' and most news organizations did not delve into the climatic or health aspects of the incident.

Overall, mainstream print and TV news coverage of climate change in Pakistan can be divided into four types:

1. The first type, mentioned above, is the 'breaking news' kind of coverage that often follows an extreme weather event, such as floods or droughts. This is mostly disaster coverage focused on assessing deaths, destruction, rehabilitation and relief measures (Raza and Birmani 2010). Such stories get more airtime on Pakistani TV news channels and are often played repeatedly in regular and special news bulletins.

2. The second type of news coverage is event-based or general assignment reporting. The importance of climate change as an action item by the government and non-governmental organizations has fuelled such coverage in Pakistani media. Consequently, news reports on climate change-related seminars, conferences,

workshops, report launches, project launches, project terminations and international celebrations appear in Pakistani print and TV media. These events mostly involve a mix of climate experts and government officials, and the coverage routinely focuses on facts mentioned by the speakers (Muhammad 2014); This sort of coverage is also due to NGOs trying to engage journalists to report more on climate change issues, but since the NGOs usually work on a project-by-project basis, the coverage is limited to the duration of specific projects rather than considering the overall picture.

3. Third, environment and climate change reporters tend to report on the political, management and administrative affairs of government bodies and officials responsible for climate change response in Pakistan. These stories follow the typical news slant of Pakistani media in which the government's inefficiencies, shortage of funds, lack of capacity or skills, delays, nepotism and corruption are exposed. These are important stories for the public whose tax money is being spent on government efforts against climate change. Also, most of the time these stories in print give context about the larger climate change narrative (Shahid 2012; Saeed 2013).

4. Finally, the fourth type of climate change reporting in the Pakistani mainstream media consists of in-depth feature articles on climate change issues in a bid to generate debate. These stories are more prominently found in mainstream English print news and somewhat in mainstream Urdu magazine news (Shahid 2013; Sahi 2012). Broadcast and Urdu print enterprise reports are rare. As Billett (2009) notes for the Indian English-language press, a scenario similar to Pakistan, the English press caters to a certain elitist audience. Consequently, articles written in the English papers do not reach a mass audience. As a result, most people in Pakistan do not have awareness of the specific terms the English media might use in their news reports. Only 5% of the Pakistani population has knowledge of climate change as compared to other Asian countries 'such as India (22%), Indonesia (32%) and China (41%)' (Zaheer and Colom 2014, p. 23).

In sum, Pakistani media is not taking on an objective role in climate changes debates due to the outlined social, political and economic factors.

Social Media and Climate Change in Pakistan

In Pakistan, alternative sources of climate change news are websites, online magazines and, increasingly, blogs.

Like mainstream news media, Pakistani social media is also not playing any role in climate change efforts; rather, it is a virtual medium for political activism, civil agitation, political and celebrity scandals and a battleground between supporters of different political parties. Instead of promoting debates on national issues, it indulges in fragmentation and spurring sectarian violence. The only unexpected role that it played was to facilitate networking and communication among the activists, and the mobilization of resources for those affected by the 2010 floods. Yusuf (2008) argues that being disillusioned by the political inefficiency, bureaucratic corruption and hesitation of international organizations in releasing funds for relief efforts, the professional and educated class used the platform of social media for fund raising and distributing shelter, clothing and food directly in the affected areas. Even the Pakistani diaspora living abroad created Facebook pages for fund-raising and sharing information. For accountability purposes, activists documented the collection and distribution of goods among the flood-stricken rural people by posting videos on YouTube and updating about relief activities on the microblogging site Twitter. Although web-based floods activities are limited in number, they indicated the emerging trend of using digital media to deal with climate-induced crises.

Apart from this, another good example is online media such as the *Express Tribune*—an online newspaper—which facilitated readers to share and spread articles on the floods of 2010 by integrating the Facebook application within the Express Tribune website. Unlike other online news media, the *Express Tribune* reserved the comment section not only for commentators and analysts, but also provided an opportunity to readers to debate on the uncoordinated response of government towards the 2010 floods by way of articles, comments and opinion pieces (Michaelsen 2011).

The above discussion indicates that different stakeholders exist and shape the local politics of climate change in Pakistan. Each one has a role, with varying degrees of importance. Some are more active than others; for example, international bodies, NGOs and civil societies are more active than the government, scientific experts and media. Others, like corporations, only give lip service towards strengthening national

climate change efforts. Further, some stakeholders, namely the public, are unaware of their role and have no say in local climate change politics. All these actors are involved in complex relations with each other, which, as a result, frame the discourses of climate change. These glocal-relational practices of climate change actors made Pakistan an ideal site to develop a conceptual framework to conceptualize the glocalized risk of climate change.

Glocal Media Sphere of Pakistan

Pakistan's mediascape is comprised of traditional media, including television, radio, newspapers and wire services, and social media (social networking sites, blogosphere and YouTube). As Yusuf (2008) argues, 'the Pakistani media landscape is multifaceted, comprising a combined—or alternating—use of different mainstream media sources … and new media platforms' (p. 2).

Traditional media is the main source of national and international news in the country and encompasses both broadcast media (television and radio) and print media (newspapers and news agencies). Compared to other South Asian countries, Pakistani mainstream media is enjoying overall freedom of expression, with the exception of a few cases such as political developments, terrorism and the Pakistani-Indian conflict, where media is restrained to state policies.

Television is the most reliable means of communication to the general public. Its audio and visual features and immediate reporting of events earned it the status of most popular and leading source of information for the dense population of Pakistan (Ricchiardi 2012). There are three types of channels, namely terrestrial, cable and satellite. The state-owned Pakistan Television Corporation is a terrestrial channel whose audience is much larger in number than the cable and satellite channels because of its reach to far-flung rural areas of Pakistan. It has five stations, including one in each of the four provinces and one in the capital territory. According to the Gallup survey report, out of 86 million people, 48 million television viewers watch Pakistan television channels (Ricchiardi 2012, p. 11).

In addition, the people in Pakistan have access to 90 satellite and cable channels. Geo, ARY, Samma, DUNYA, Express and Dawn are the leading channels, which are setting the standard of other news channels. Apart from these, the public also tunes into foreign channels like CNN, BBC

and Al-Jazeera to fulfil their information needs. Additionally, local language channels like Sindh TV and AVT Khyber are catering to the needs of the local population.

In developing countries like Pakistan, where, due to the energy crisis, electricity is most of the time not available specifically in rural areas, radio is an important channel for information and entertainment, especially with the high use of cellular phones that have built-in FM radio functions. Pakistan's radio landscape is still dominated by state-controlled radio networks. Although there are 162 licensed radio stations throughout the country, they cannot produce and broadcast their news except for weather reports, in line with the rules and regulations prescribed by the Pakistan Electronic Media Regulatory Authority that restricts radio programs to public services like education, entertainment, information and other culture and religious services (PEMRA 2014). Furthermore, the coverage radius of FM radio networks is limited to the radius of 50 kilometres (Ricchiardi 2012, p. 12). This reflects the state's control of radio and its intention to carefully monitor radio from becoming vehicle of civic engagement and community organization. The only other reliable and credible sources of news information are the BBC Urdu service and Voice of America. In that scenario, for news purposes, rural inhabitants—specifically farmers and people of the tribal belt—are more prone to using radio because of its cheap availability. Being aware of the importance of radio as a tool of propaganda in the tribal belt, Talibans opened their radio station to incite hatred and feelings of animosity against Pakistan. Against this backdrop, the government of Pakistan banned 100 illegal radio stations in the tribal areas (PEMRA 2009).

The future of newspapers is not promising because of the severe competition from television, FM radio and Internet. According to the Federal Statistical Bureau of Pakistan, the total dailies in circulation are approximately 252, whereas the total number of weeklies and monthlies are 139 and 279, respectively. Overall, the total daily sales of all print media reach 6.1 million copies. According to the Infoasaid report, three main groups—namely *Jang, Nawa-i-Waqt* and *Dawn*—are leading the print media market, and even now extend their activities to broadcast and online media. The Nawa-i-Waqt group are right-wing conservatives, whereas Dawn is liberal and the Jang group is moderate conservative. All these groups have newspapers, magazines, TV channels and online papers. In recent years, another group by the name of Lakson emerged in the media market and gained considerable reputation for their

objective news reporting. The group has Urdu (*Express*) and English dailies (*Express Tribune*) as well as a news channel (*Express News*).

In addition to newspapers and radio, two news agencies started working in the post-division period. One was the Associated Press of Pakistan, which was later on taken by the government due to its financial collapse, while the other was Pakistan Press International. Both of the news agencies are providing wire services to Urdu and English media in Pakistan as well as abroad. Furthermore, there is a third news agency named Online News Network International, famous for its news photograph services at national and international level.

Social Media in Pakistan

Social media is an alternative source of information for the masses, owing to mainstream media's preoccupation with issues of national importance and its focus on big cities and urban centres, leaving small cities and the local rural population out. This information gap is bridged by social media, which serves as an alternative platform for people to access and share information on local events and issues (Kugelman 2012). The trend of using social media for information sharing and communication purposes has increased over the years due to rapid growth of Internet use in Pakistan since 2009. For Yusuf (2009), it is the impressive growth of mobile communication technology that facilitated the use of social media in Pakistan. According to Yusuf (2009), there are 150 million users of cellular phones in Pakistan. Similarly, Kugelman argues that Facebook and Twitter are the most used web-based applications in Pakistan for sharing audio and video with other people. Though Pakistan ranks lower in Facebook use (3.4%) than India (3.8%) and Sri Lanka (5.8%), its users almost doubled (1.8–3.6) in the short span of 6 months, from late 2010 to earlier 2011. Additionally, the microblogging site of Twitter is the 'tenth-most visited website in Pakistan in June 2010, compared to 14th the previous year' (Kugelman 2012, p. 2). This is followed by the blogosphere, an important medium for information and opinion sharing in Pakistan. Although limited in size, it is active in discussing issues of national importance. For instance, the 'Tea Break' blog, which has 3000 followers and seeks to promote local content by providing a free channel for distributing blog entries (textual and video) on various topics (Michaelsen 2011).

From a Pakistani perspective, social media is performing five functions:

The first is providing space to news stories that were not dealt with by mainstream media. Secondly, it is a platform for the mobilization of protest campaigns and social movements. Thirdly, it is used as a way to collect funds and donations for humanitarian crises, such as the floods of 2010. Fourthly, it is a platform for the advocacy of social issues like child labour, domestic violence, women rights and sexual abuse. The final function is its use for political communication purposes. A very good example of this is the large-scale presence of political parties like Pakistan Tehreek-e-Insaf and Pakistan Muslim League Nawaz over the social media networking sites. In brief, social media in Pakistan is used mostly for communication purposes and information sharing, and not for social change. There are few exceptional cases like the use of social media by students of the Lahore University of Management for political agitation against martial law and the dismissal of Pakistan's Chief Justice. Overall, it is no catalyst for social change. Kugelman (2012) attributed this to a number of reasons; the main one is the limited Internet access for the masses as only 20–30 million people out of 180 million population. Overall, it can be argued that social media is only a source of information and so far has failed to bring any role in social change. As one blogger says, 'Twitter was clogged with dissident discourse and Facebook statuses sprung up to register protests and yet it all resulted in absolutely nothing' (Kugelman 2012, p. 5).

Emergence of the Glocal Media Sphere in Pakistan

As argued by Yusuf (2008), there is an evolutionary process behind the existing landscape of Pakistani media that goes back to pre-separation period of the subcontinent. Three famous news dailies of that period were the *Daily Jang* (founded in 1939), *Nawa-i-Waqt* (founded in 1940) and *Dawn* (founded in 1941), which continued on even after the independence of Pakistan in 1947, and have emerged now as three leading media groups considered to be the main agenda setters for Pakistan society. In Urdu print media, *Jang* and *Nawa-i-Waqt* are the leading newspapers, having a vast circulation and being read by a large number of rural and urban people. On the other hand, in English print media *Dawn* is the leading newspaper, whose target audience is limited to the civil, military and political elite of Pakistan. Apart from this, Pakistan also inherited three radio stations in 1947 that later on became the main source of information and catered to the educational and entertainment

needs of the masses until November 1964, when Pakistan's first television station was established in the public sector. Since its inception, Pakistan television promoted national solidarity among the four provinces, supported national and international policies of government, and claimed to inform, educate and entertain the masses.

Up until 2002, state media—particularly Pakistan Television (PTV), Radio Pakistan and APP (news agency)—dominated the media site, with few Urdu and English newspapers in the private sector that also had a certain ideology and pro stance towards their respective political parties or martial regimes. Furthermore, they faced 'strict military censorship [and] unconstitutional political curbs on freedom of expression' (Ricchiardi 2012, p. 7). This control over information by state authority turned the Pakistani audience 'to illegal satellite dishes and illegal channels to circumvent censorship and religious repression' (Ricchiardi 2012, p. 7). To counter this cultural flow and Indian use of soft power (media) for propaganda against Pakistan during the crisis of Kargil, the military leadership was spurred to broaden the scope of Pakistani media by breaking the state's monopoly and issuing licences for private media set-ups. These would cater to the information needs of the Pakistani society and foster the image-building of Pakistan at the transnational level. This led to a boom in the media sector with the opening of many channels and radio stations. As a result, the Pakistan Electronic Media Regulatory Authority (PEMRA) was founded in 2002 to issue licenses and monitor the news content of electronic media. Yusuf (2008) notes that since 2002, '56 privately owned television channels have been licensed in Pakistan and 48 were fully operational as of May 2008' (p. 7). Geo TV earned the status of first cable television in Pakistan, followed by ARY, the second most-viewed channel in the private sector. Cable TV grew in the subsequent years (from 1.5 million subscribers in July 2004 to 3.27 million in July 2007). During this period, the news content became more investigative and critical of government policies. However, the slackening of government control over the media lasted only a few years, until the lawyer movement against the removal of Pakistan's Chief Justice changed the whole scenario. In this situation, the media's non-stop coverage of demonstrations and protests posed a threat to the military regime. All this led to the declaration of a state of emergency on 3 November 2007 by the Musharraf government, which suspended the constitution, dissolved the Supreme Court and curbed press freedom by issuing decrees that put restrictions on both print and electronic media to publish or broadcast:

anything which defames or brings into ridicule the head of state, or members of the armed forces, or executive, legislative or judicial organs of state … Jeopardize or be prejudicial to the ideology of Pakistan … incite violence or hatred or create inter-faith disorder or be prejudicial to maintenance of law and order. (Human Rights Watch cited in Ricchiardi 2012, p. 9)

In sum, the media was blamed for the mediatization of politics and its freedom was curbed by a PEMRA ordinance in 2007, which allowed the government to restrict media coverage by cancelling licences, stopping live transmission, and even sealing media houses and seizing their technical equipment.

During the 2007 emergency, when the Pakistani government took off the transmission of private news channels, a media vacuum was created. To fill that gap, Pakistanis '[who] were driven by a desire to access information … turned to alternative multiple media sources' (Yusuf 2008, p. 3). The most reliable media source that people looked at was the websites of private news channels like GEO, ARY and AJ TV, which copied live audio and video streaming of the political crisis, and also uploaded videos on YouTube for easy circulation. This was followed by the use of Facebook, Twitter, Flickr and the blogosphere during the emergency as platforms for online petitions, newsfeed from print and electronic media, making up a public sphere of debate on the emergency. For instance, video clips of detained political leaders were also shared on a Facebook page titled 'We Oppose Emergency in Pakistan'. Another good example is the use of a blog named Emergency Time by LUMS University students, concerning the political agitation against the unlawful removal of Pakistan's Chief Justice. Thus, cable news channels websites, Facebook, Flickr, YouTube and blogs played an important role in spreading 'civic engagement and greater connection across social boundaries' for community organization (Yousaf 2012).

However, this did not last long because the government, being informed about the dissemination of information and the organization of the community over the digital networks, clamped down all these resources by jamming cellular networks, instructing Internet providers to block YouTube, limiting Internet speed and banning blogging sites. They also used the protestors' same technology against them—for example, using Flickr to identify protestors and arrest them.

The strategy did not work well, first because the public sphere extended to the Pakistani diaspora, who continued using Facebook to organize protests across the globe. Second, realizing the gravity of the situation, student protestors uploaded self-generated video clips and images to CNN's iReport, an online citizen journalism initiative. Consequently, 'international mainstream media outlets such as CNN, the BBC, and the UK-based Channel 4, increasingly sought out hyper local reporting posted to local blogs, YouTube, and Facebook' (Yusuf 2008, p. 5). All this resulted in the dismissal of Pervez Musharraf, the president of Pakistan. In brief, Musharraf became victim of his own media revolution, and the new political government uplifted the media restrictions. Thus, the emergency of 2007 was the culmination point of the merging trend of old and new media. However, that is not the only instance indicating the interconnectivity of local, global and digital media.

There are a number of examples when both, social media and mainstream local and global media, worked together for the social cause. This was the case in the assassination of Benazir Bhutto, ex-prime minister of Pakistan. State officials stated that a bomb explosion had been the cause of Bhutto's death, but a video was leaked on YouTube showing that she had died by gunshot before the explosion. This video was later picked up by UK-based Channel 4 and as a result, the state had to admit that there had been lapses in security (Yusuf 2009, p. 23). Another good example is the mobbing and killing of two brothers in Sialkot, accused of being robbers, while the police stood and watched. This video was uploaded to YouTube and fed to the media, resulting in immediate action of the Chief Minister of Punjab. Even during the elections, 'bloggers were regularly posting links to news reports about election rigging, voter intimidation, recommendations from international monitoring committees, and articles from international print media analysing the importance of the February 2008 elections' (Yusuf 2008). All this shows that mainstream media has used digital media as source of information for news production and also to extend its public sphere via digital networks for the dissemination of news across borders and for moulding public opinion. For example, 'Pakistan Policy' is a website compiling 'streaming audio and video content from the independent news channels to allow users across the country and diaspora to enjoy uninterrupted news reporting on political events' (Yusuf 2009).

Apart from this, social media is also promoting citizen journalism by encouraging civic participation over the online news platforms. A good

case is the Dawn and Express Tribune online forums, where amateurs can comment and debate on issues of national importance. However, the ratio is limited because the total number of Internet users is around 23 million (12% of the total population). According to the Information, Communication, Development and Technology Index, Pakistan's position is 142 out of 166 countries ('ICT ranking: Pakistan among least connected nations, stands at 142nd place', *The Express Tribune* 2014, November 30). The report further states that 4.3 billion people are still offline, and Pakistan's share is almost 90%. Another reason for this low participation is a low-quality network, substandard dial-up connections and absence of fibre-optic cables. A recent survey by BBC (2014) records only one per cent of rural citizens as using the Internet, and the number of male users is higher than of females. Furthermore, English is the language of the Internet, whereas a large number of Pakistanis only read and write in Urdu (with the exception of the educated class). As a result, the rate of Internet use is low.

Gap in Media Climate Change Research in Pakistan

In contrast to the international scholarly contribution towards media and climate change research, mostly by Western scholars, the volume of both, qualitative and quantitative media climate change research from developing countries (and more specifically South Asian countries: India, Pakistan, Bangladesh, Nepal, Sri Lanka, etc.) is low.

Even from the perspective of the South Asian region, India and Bangladesh are far ahead of Pakistan in media literature on climate change. A number of reasons can be responsible for such a bleak picture. Firstly, the limited number of media research scholars in Pakistan because of the late media boom period that started only in 2002. This increased the demand for professionals in the media industry. To overcome this demand, media and communication departments were established in public and private sector universities, and already established media and communication departments of public sector universities were upgraded. According to a study, Pakistan has so far 31 Ph.Ds. in media. As a result, a research culture could not be developed properly. Secondly, the old teaching methodologies, limited availability of resources and outdated curriculum are producing only media workers and do not encourage young people to pursue academic careers in the field. Thirdly, little focus of media researchers on social and developmental issues and more

around three main areas of research: (1) media development in Pakistan (media freedom, media ethics, media laws, media sociology), (2) peace and conflict studies (peace/war journalism, conflict reporting, image framing) and (3) mediatization of politics (Yusuf 2008). All this contributes to the little academic research on media and climate change issues in Pakistan.

PAKISTAN IN THE FOCUS OF INTERNATIONAL CLIMATE CHANGE JOURNALISM RESEARCH

Surprisingly, a few studies are available on media representation of climate change in Pakistan by both local and international media scholars. For instance, Boykoff (2008) analysed the coverage of climate change issues in Pakistan-English newspapers from 2004 to 2009. Guriro (2009) examined environmental coverage in the local press and recorded 1685 climate news stories over the course of a year; 58% of these stories were about campaigns and protests against 'anti-environmental projects', 17 per cent covered government policies regarding climate change, 23 per cent were on water and sanitation issues, and only 2 per cent covered international climate change issues. Guriro also found that climate change coverage was only 9% of the total environmental reporting. Ali (2010) conducted a content analysis of the leading English newspapers (*Dawn* and *News*) and explained that English newspapers give more coverage to climate change issues because of their well-educated, elite audience. She found that there was no space for climate change news on the front page. Its only presence was on the foreign pages of both newspapers and on the editorial page in the *Dawn*. Further, the newspapers did not have any pictorial coverage of climate change issues. Ali further argued that climate change news stories are sourced from international news agencies, and the focus of both newspapers is on international organizations (like the UNFCC and the UNDP) and international political figures, with no reference to local political actors. Consequently, it can be argued that Pakistani print media approaches climate change as a global, and not a local issue. Even the National Council of Environment Journalists (NCEJ) acknowledges the inadequate media coverage of climate change issues: they found that 86% of media coverage is on political affairs/entertainment and 2.8% is on environment and climate change issues (Guriro 2009).

The above studies suggest that Pakistani media is not giving adequate coverage to climate change issues. However, the results cannot be generalized to all Pakistani media because these studies were conducted of English newspapers, which are read mainly by the political and military elite.

Research is needed on vernacular press (Urdu and local language newspapers), as comparative analysis of Urdu and English newspapers, which should be conducted to uncover the differences in climate change news coverage. Research should also be conducted on print media (magazines and wire services), electronic media (radio and news channels), as well as on online and social media.

Additionally, the content of climate change news stories is another area of research. Currently, a lively debate is being carried out about the quality of climate change information in the media and in public and scientific circles; however, no research has thus far attempted to analyse the quality of information, its flow between different actors, and influential factors—such as limited access to information, credible sources of information and the communication gap between media and experts.

These factors hamper the flow of information and distort the content of climate change news stories. Findings of this type will help to improve the content of climate change news stories. A particularly notable area of media research is source media relationship in the construction of climate change news. Exploring this area will reveal the media's use of different sources and its influence on the content and reporting of climate change news.

Apart from media representation studies, there is a need to conduct research on the production of climate change news stories in different media outlets in Pakistan. It will expose factors affecting the new production of climate change stories and will provide ways to increase media coverage of climate change issues. Diverging from the traditional approach of qualitative and quantitative content analysis, such research should be conducted using ethnographic interviews with journalists and editors working in news media organizations. These interviews would provide material to analyse the influences of organizational structure and routines on the construction of climate change news. Another promising sub-area of climate change news production is the relationship between journalistic demographic variables (such as gender, education, professional experience, training, cultural and language) and climate change news production. By focusing on these areas, the quality and quantity of climate change news coverage can be increased.

In addition, reception studies are another unexplored area in Pakistani media research. A few studies have been conducted on the public's poor understanding of climate change by international organizations, such as Climate Asia (2013) and Pew Global Attitudes (2007). However, no study has explored the reason behind this. Additionally, the role of Pakistani media in creating public awareness is a mostly unknown area of research that needs the attention of media scholars. Research in that area will provide practical suggestions to improve media partnerships and raise public awareness.

Research into the media and intergovernmental conflicts of climate change is also important. Undoubtedly, media scholars are interested in the media's presentation of global conflicts (war on terror and regional Indo-Pakistani conflicts). However, studies rarely address media and climate change conflicts, or comparative studies of Pakistani and Indian media on climate-related conflicts (such as those concerning the Siachen Glacier and water issues) which have the potential for a severe geopolitical crisis.

The developmental role of climate change journalism is the most under-explored area of research. Such research could direct media attention to climate change adaptation and mitigation coverage. In this way, media can be used to accelerate climate change policymaking and its effective implementation measures (adaptation and mitigation).

In summary, the relationship between media and climate change is under-researched in Pakistan. There is a gap in the global literature on media and climate change research that needs to be bridged. As opposed to traditional approaches, these debates need to be addressed using a theoretical lens that is not nation-specific, and one which provides a much-needed framework to conduct future studies on climate change media within the 'scales' of interconnected global public spheres.

Conclusion: Pakistan as a Glocal Site of Cosmo-media Climate Change Research

In this chapter, we argued that Pakistan constitutes a glocal site to conduct transnational media and climate change research. Firstly, Pakistan is a local site of global climate changes in context of its marginal contributions to global emissions and high vulnerability to climatic changes. Secondly, it is a playground for different local, global, state and non-state actors, whose complex relational interactions shape the local cultural

politics of the globalized risk of climate change. Thirdly, there is the emergence of a glocal media sphere in Pakistani media due to convergence of old and new media technologies. Fourthly, Pakistani media is an under-researched area in global climate change media scholarship. Finally, Pakistan is a 'developing' country, so a framework developed in the Pakistani context might be generalized for other developing countries of the South Asian region. Thus, Pakistan may provide an excellent case study for developing a conceptual model to conceptualize local and global media debates on climate change, which are intertwined due to information and communication networks.

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Methodology

The last two decades witnessed the growth of media scholarship about climate change. The major foci of media and climate change research have been the representation of climate change across different media outlets in different contexts and the implications on the public agenda, pressure groups, policymakers and scientific experts. An interesting fact is that in the last two decades, scholarly interest has shifted towards media coverage of climate change issues by empirically analysing the content of climate change news stories (Schäfer and Schlichting 2014) with the exception of a few ethnographic studies that inform the 'factors impeding or enhancing climate change coverage', and few critical studies providing insights into the 'production and construction' of climate change news stories (Anderson 2009, p. 11).

A meta-analysis of 133 publications shows ample proof of a rise in research articles on media coverage of climate change, from 27% (36) articles in the 1990s to 41% (55) in 2004. The share of European scholars is 40.9%, followed by a share of 23.6% by North America scholars (Schäfer and Schlichting 2014). In contrast, Asian and African scholars' contribution is 15.6 and 4.6%, respectively. This indicates the dominance of Western scholars in the field and the application of a Western model to the context of developing nations. The national 'outlook' is taken for granted as a research norm and ideological framework for climate change media research. Therefore, the nation remains the primary

unit of analysis in all the case studies and comparative, longitudinal and cross-sectional studies in media and climate change scholarship (Schäfer and Schlichting 2014).

Two-thirds of media research was conducted on print media, whereas only 15.5% analysed broadcast media like television and radio. With the rise of the Internet, media scholars started taking interest in the online discourses of climate change, resulting in 17% of articles on this topic on news media websites, social media and the homepages of different political, scientific, corporate, non-government organizations and actors in 2010 (Schäfer and Schlichting 2014). Apart from this, the existing literature provides ample evidence that media scholars used, both quantitative and qualitative methods to analyse the different media outlets; however, quantitative research methods are dominant (47.8% vs 44.8%, according to Schäfer and Schlichting [2014]). The share of mixed methods is 7.1% with an upward trend in 2010 (Schäfer and Schlichting 2014); however, qualitative research and a focus on the 'reflexive' epistemic sphere of journalism practice are still only on the periphery of journalism research.

The chapter opens with a discussion of the professional construction of social reality frameworks which we consider an ideal reference when addressing the dimension of journalistic practice. Subsequently, the qualitative research method used (semi-structured interviews) the selection of climate change media journalists through chain referral sampling, and the interviewing process will be discussed. Lastly, the chapter addresses interpretative phenomenological analysis (IPA) as a strategy to examine the outcome of the interviews.

PROFESSIONAL 'CONSTRUCTION OF SOCIAL REALITY' FRAMEWORK

To gain an insight into the epistemological reality of day-to-day journalistic practice, we base our research strategy on the paradigm of the professional 'construction of reality' drawn from social constructivism, i.e. the assumption that 'reality is socially constructed and the sociology of knowledge must analyse the process in which this occurs' (Berger and Luckmann 1966, p. 13). In line with this approach, the focus on the professional 'construction of reality' is based on the assumption that every professional adopts a specific subjective process to construct reality.

Such subjective processes are based on day-to-day experiences and professional routine structures; indeed, professionals share this reality

in terms of 'continuous interaction and communication with others' (Berger and Luckmann 1966, p. 37), resulting in the construction of an 'intersubjective common sense world of reality' (Berger and Luckmann 1966, p. 34). To assess the way in which media professionals analyse the subjective process which guides as their practice is an important focus of studying, for example journalistic practice. Interview situations allow the objectification of professional reality in the form of language:

> The sum of linguistic objectifications pertaining to my occupation constitutes another semantic field which meaningfully orders all the routine events I encounter in my daily work. Within the semantic fields thus built up it is possible for both biographical and historical experience to be objectified, retained and accumulated. (Berger and Luckmann 1996, p. 56)

A qualitative approach is needed to address these issues as qualitative research adopts an informal, inductive and subjective approach:

> A qualitative study is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting. (Creswell 1998, p. 15)

In the following, we first provide a baseline for this qualitative study and justify the multi-stage qualitative case study and the selection of the sample population—local media, city environmental journalists in Pakistan—followed by a discussion of the qualitative research method used (semi-structured interviews).

Second, we outline the selection process of climate change media journalists through chain referral sampling and the interviewing process. Lastly of all, we outline the interpretative strategy to analyse the outcome of local journalist interviews.

Case Study of Environmental Journalism in Local Media

In the first stage, we use a 'single case study' approach (Yin 2003), focusing on a 'local place'—local media environmental journalists from cities in Pakistan. Most of the previous research adopts case studies from USA, followed by European countries and central Asian countries with few case studies from the South Asian region.

Even in the South Asian region, the focus of media and climate change research is on India and Bangladesh. Importantly, these single case studies are conducted in the context of national media. Alternatively, we focus our case study on the 'environmental' journalist as the 'unit' of study. By 'environmental' journalists, we mean reporters who are engaged in environmental reporting on a routine basis.

The reasoning behind their selection is that these journalists have obtained knowledge and awareness of climate change processes, and in addition, they have lifelong experience in environmental reporting of climate change events, issues and debates. Additionally, they have working relationships with different local and global climate change stakeholders, who provide them with the information required to construct climate change news stories. Hence, they comprehend and can better explain the social reality of climate change.

Diverting from the traditional focus of a national media journalist, we delimit environmental journalists to local cities: in other words, we adopt the 'local' as a unit of observation for conducting this study. By local we mean: (1) a geographical or physical unit on the basis of size and range (Guy 2009) and time and space (Giddens 1984), and (2) a place to be inhabited by individuals, groups, organizations and communities closest to each other, having physical interactions with each other and digital interactions with individuals, groups, organizations and communities of other geographical units (Robertson 1992; Haggett 1975, p. 2).

These definitions provide a baseline to equate the city with the 'local' as a unit of observation on multiple grounds. First, 'cities form easily identifiable and mapping regional units' (Haggett 1975, p. 420). Second, more and more people are living in cities. Third, human organizations and institutions are 'increasingly city-centred' (Haggett 1975, p. 420). Fourth, they are the nodes of 'information processing and decision making' (Castells 2002, p. 372). Finally, cities are the centre of commercial, industrial and administrative activities (Sassen 2001, 2004).

We conceptualize local media cities as production, administration, information and business sites for news media. Some of them have the status of core media cities, such as Karachi and Islamabad, where in addition to peripheral services, top-level management decisions are also made. Others are peripheral media cities, such as Gilgit and Azad Kashmir, which are only involved in producing and providing news services, and function as centres for generating revenue.

However, at the city level, environmental journalists are attached to different media outlets. This takes us to the second level of multi-stage case study, limiting local media city environmental journalist with reference to different types of media outlets depending on the structure, content and format of news delivery.

MEDIA ENVIRONMENT AND LOCAL JOURNALISM

In the second stage, we employ a 'multiple or collective case' (Stake 1995; Yin 2003) study approaches to further limit and frame local media city journalists within the context of their working environments, i.e. electronic, print, online news media. Such an approach enables us to analyse the similarities and differences among journalists of different media outlets in the construction of climate change reality. The following 'mediagraphy' of media city environmental journalists of Pakistan reveals the specifics of the Pakistani risk media sphere.

Pakistani media are the most vibrant of the South Asian media landscape and are comprised of newspapers, news agencies, television channels, radio channels and online media, with 85 television channels, 155 radio stations, 286 newspapers and 68 weeklies and monthlies (Eijaz et al. 2014, p. 245). Characteristically, media are multi-ethnic, multi-linguistic and multicultural. However, media can also be broadly categorized into English and Urdu media. Urdu media are consumed by most of the urban and rural population, whereas the target audience of English media is limited to the urban population, including civil and military bureaucracy, business and elite class (International Media Support 2009, p. 14). According to the PIPO media report (2010), the most widely consumed media in Pakistan is television, which is used by 89% of the Pakistani population, followed by newspapers (25%), radio (21%) and Internet (4%). Yousaf (2012) further sub-categorized national media consumption into rural and urban consumption. He states that the consumption rate of television among the urban population is 89%, which is higher than the rural consumption rate of 66%. In contrast, radio consumption by the urban population is 37%, which is greater than the rural consumption rate (18%). As far as newspaper and Internet are concerned, the trend of reading (37%) and web surfing (8%) in urban areas is higher than in rural areas, where online reading and browsing are 8 and 1%, respectively (Yousaf 2012, pp. 227–228).

Pakistani media work on a financial business model and advertisements are the main source of revenue. During the period 2010–2011, total advertising expenditure was 32 billion rupees; the share of government advertising was 5 billion rupees. This makes Pakistani media heavily reliant on the government and private sector for advertising revenue. Consequently, this sacrifices media freedom and forces it to co-opt with political and corporate actors. In the upcoming section, we will provide an overview of the Pakistani mediagraphy by discussing print, electronic and online media in the city (Yusuf and Shoemaker 2013, pp. 23–24).

Print Media

Print media are the oldest type of media in Pakistan and predate independence in 1947. Print media played an important role in the freedom fighting movement. Even after partition, it remained under the control of private owners, who were critical of both sides of politics. Print media and the political elite have had strained relations, with many ups and downs.

Print media are published in eleven different languages. Urdu newspapers dominate the market followed by English newspapers. The Urdu newspapers are 'conservative, folkloristic religious and sensational' (International Media Support 2009, p. 20). A large number of people across rural and urban populations read them. In contrast, the English newspapers are limited to the civil, military and political elite. They observe a more liberal and professional attitude in their production of news.

A downfall in print publications has occurred over the last decade. In 1997, the total number of daily, monthly and minor publications was 4455, but by 2003, six years later, only 945 remained. However, the circulation was increased during this time. The daily circulation of minor and major publications was 6.2 million in 2009 (International Media Support 2009, p. 20). According to a peace institute study, there are 142 regular newspapers in Pakistan (International Media Support 2009, p. 21). However, three main media groups—the Jang Group, the Dawn Group and the Nawa-i-Waqt group—dominate the media market. They have political affiliations with government and opposition parties (International Media Support 2009, p. 21).

News Agencies

The wire service is an important component of Pakistan's media structure. It provides visuals and updates to news organizations. Pakistan has one state-owned news agency and three in the private sector. All of these three wire services receive subsidy from the government so that they remain economically viable in the current financial climate, with low rate subscription rates (i.e. 2000 rupees per month) and stiff competition from big media organizations. The Associated Press of Pakistan is the only official news agency working under the information ministry. Its main function 'is to report, gather and distribute domestic and foreign news' (Yusuf and Shoemaker 2013, p. 13). It also provides 'economic, financial and sports reports' and 'projects national events' (Yusuf and Shoemaker 2013, p. 13).

Pakistan Press International is the second largest news agency in Pakistan and the largest in the private sector. Its political news is considered credible. It also covers social, cultural, and economic and sports news from the local cities. In addition, it also provides on-the-job service training to newcomers. The online news agency is known for its photograph wire service and is most relied upon by newspapers and news channels. It also provides bilingual news and publishes Pulse, a weekly. News Network International is known for its Urdu wire services and is subscribed to by almost all of the mainstream media. It publishes news in English, Urdu, Sindhi, Pashto and Arabic (Yusuf and Shoemaker 2013).

Radio

Radio is the only medium that reaches far-flung areas of Pakistan, where there is no electricity, television signals are weak and no availability of satellite or cable TV. In such underdeveloped areas, radio is the only reliable source of information for the local people. However, in recent years, listening to FM radio has become increasingly popular in the urban cities of Pakistan. The rationale behind this is the media policy of 2002, which established the 'Pakistan Electronic Media Regulatory Authority' to issue licences to groups interested in launching radio stations in the private sector. Subsequently, many FM radio stations have been launched in different cities of Pakistan (International Media Support 2009, p. 22). Another contributing factor is the increased use of mobile phones to listen to

music on FM radios and to interact with FM radio stations: 'Over half of regular radio listeners listen through their phone' (Yusuf and Shoemaker 2013, p. 17). There are 40 FM radio stations reaching millions of rural and urban populations. However, these radio stations have limited coverage due to the 50-kilometre radius imposed by Pakistan's electronic media regulatory authority (Ricchiardi 2012, p. 12). The newly established FM radio stations have problems training radio professionals, as universities do not teach practical radio skills. Therefore, most of these FM radio stations only play music and repeat news from the Pakistan broadcasting radio network, and to a limited extent from the BBC Urdu service and Voice of America (Ricchiardi 2012, p. 12).

In the current scenario, state-owned radio still maintains its monopoly by reaching a large rural and urban audience throughout the country. According to media reports, Radio Pakistan and FM 101 are the most popular, as their combined 31 stations reach 96.5% of the population and amass a total of 95.5 million listeners (International Media Support 2009, p. 24). Its only rivals are illegal radio stations run by religious extremists in Pakistan's Federally Administered Tribal Areas (FATA). During the last year, PEMRA shut down 100 illegal radio stations in FATA International Media Support (2009).

Television

In 2002, Pakistan witnessed a record growth of TV channels due to the media policy of the Pervez-Musharraf government. Before this time, only the state-owned channel PTV existed, which was launched in November 1964 and provides terrestrial services to a majority of the rural and urban population. To this day, most of the rural population have no access to cable and satellite channels. According to Gallup, 'Pakistan had 86 million television viewers in 2009, with 48 million–more than half–being terrestrial viewers who could watch only PTV channels' (Ricchiardi 2012, p. 11). Overall, Pakistan counts 49 TV channels—15 of which are news channels, 32 devoted mainly to entertainment and two to religious programming (International Media Support, pp. 33–36). Geo network, Dawn, Express, ARY, DUNYA and Samma AJJ are the major news networks. Pakistanis have access to around 90 private cable and satellite channels. Geo News, Dawn News and Express News are known for their news reporting and current

affairs programmes. There are more than 20 foreign channels, including CNN, BBC, Al-Jazeera, Fox News and five religious TV channels. Besides Urdu, there are local language TV channels, such as Sindh TV News and AVT Khyber, a Pashto language channel based in Islamabad (Ricchiardi 2012, p. 10). The professional standards of news channels are very low; they suffer from a 'breaking news syndrome' and rely on sensationalism to increase their ratings and thus gain more revenue from advertisements. Most of the reporters have little or no media training. News and current affairs programmes are ill-informed and amateurish in nature (International Media Support, pp. 33–36). Over the last 13 years, due to this non-professional approach, leading news channels like GEO and ARY have been banned numerous times by military and democratic governments for exaggeration and misrepresentation of facts.

Online Media

Pakistan is a part of global surge in Internet usage. The government of Pakistan is using all its means to ensure Internet access. Currently, Internet users are in the minority, but they are increasing every day. There are believed to be 20 million Internet users in Pakistan. According to a BBC media action report (Yusuf and Shoemaker 2013), 'only 9–16% of Pakistan's 180 million-strong population have access to the internet' (p. 17). The PTA confirmed that the dramatic rise of smartphones increased Internet usage on mobiles, from 2.4 million in 1999 to 14 million users in 2012 (Kugelman 2012, p. 2). Simultaneously, mobile usage has risen dramatically, reaching about 115 million users in 2013 from approximately 93 million in 2009 (Yusuf and Shoemaker 2013). Further, Internet leads to an increased usage of social networking sites like Facebook. There are eight million Facebook users in Pakistan, and in the first six months of 2012, one million new users joined (Kugelman 2012).

A rising trend is also observed in the microblogging platform of Twitter. In June 2010, Twitter was 'the tenth-most visited website in Pakistan' (Kugelman 2012, p. 13). The most popular websites in Pakistan are Facebook, Twitter, YouTube, Google, Wikipedia, as well as Zemstvo, Geo TV, Jang group and BBC. The government of Pakistan blocks a number of websites from time to time, such as YouTube and Facebook, on political, religious and moral grounds. YouTube is still banned in Pakistan due to its blasphemous videos. Pakistanis are also

active in blogging, which is evident from aggregate sites like pakblogging.com. Dawn group's news website receives over ten million page views per month and is one of the most popular in Pakistan (Kugelman 2012, p. 13).

In summary, the above discussion provides a complete picture of different news media outlets operating in Pakistan and helps to further narrow down the case study of local media city environmental journalists in the context of print, electronic, foreign and online news media. Also, this discussion provides a basis for the third level of discussion on the professional demography of local journalists working in these news media organizations.

PROFESSIONAL DEMOGRAPHY OF URBAN JOURNALISTS

Having provided insight into the key parameter of the Pakistani media sphere, we move to the final stage of this multi-stage case study—professional demography, which is built upon Yin's (2003) idea of 'holistic case study with embedded units' (Yin 2003) and further delimits the environmental journalists of each news media outlet according to their ethnicity, gender, educational background and language skills, professional expertise and their role in the media organization. This enables us to analyse the professional construction of reality of each media professional and also consider the similarities and differences among them.

Ethnicity

Pakistan is a diverse nation comprising of different ethnicities, speaking different languages, practicing different cultures. This is reflected in the professional demography of local media city environmental journalists, who have different ethnic backgrounds and practice their subcultural norms, customs traditions and language orientations. In brief, ethnic origin is an important variable in bringing different shades to the construction of climate change reality.

Gender

Pakistani society displays gender inequality in almost all sectors of life. Accordingly, Pakistan's media landscape has a dismal female presence in electronic and print media. Female journalists are few in number in

all media organizations. Men outnumber women 5 to 1 in news media organizations (International Women Media Foundation 2011); they are not given their due share in the newsroom and news content, and face cultural, and social and religious barriers. Furthermore, the International Women's Media Foundation (2011) argues that female journalists are given an unwelcoming start in media organizations. They are allotted specific beats like show business and social issues rather than more serious issues like politics, the economy and terrorism. Also, they have no role in the policymaking and decision-making of news media. Women's participation is almost 16.7% at middle-level management and 13.8% at senior-level management; men occupy nearly all top editorial roles and other important administrative posts (Ricchiardi 2012, p. 11). However, the study overall witnessed an increase in the number of female journalists reporting on defence, politics, economy and sports. In view of the growing number of females in the media sector, and the difference between male and female environmental reporters in the construction of climate change reality, I also include female environmental journalists in the study.

Educational Background and Language of Reporting

The most important indicator of professional demography is the educational background of journalists, language and format of reporting. The educational system of Pakistan is divided into English and Urdu. Eijaz comments that 'teaching methods, content, techniques, and systems in English medium educational institutions encourage and facilitate analytical thinking', while Urdu medium institutions tend to encourage 'cramming and rote learning' (Eijaz 2010, p. 68). Consequently, Urdu-educated journalists are not as well-qualified and undertake propaganda style reporting, whereas English-educated journalists are more likely to undertake investigative reporting (Eijaz 2010).

Pakistan has faced extensive growth in media and the number of city journalists increased over the last decade. In 2002, there were 2000 registered journalists in Pakistan; in 2010, there were 10,000. The average age of these journalists is 27, and 80% or more have three to five years' experience (Mezzera and Sial 2010, p. 39). Most of these journalists are amateurs and lack professional experience, as 'universities tend to focus on general subjects and do not devote enough attention to the development of technical skills' (Mezzera and Sial 2010, p. 42); they

have 'outdated curricula that are not compatible with applied journalism' (Mezzera and Sial 2010, p. 39). Even press clubs and media organizations are not particularly concerned with service training or offering short professional courses for professional development. The primary reason is the slow growth of media institutions in Pakistan at university level—that is, imparting professional journalism training at universities did not keep pace with the rapid expansion of media houses over the last 25 years. Further, media owners are not keen to change their current media approach, as their goal is 'to sell and not to educate' (Mezzera and Sial 2010, p. 39). They consequently hire people who do not have relevant academic backgrounds in journalism and who gain entry into the media profession via personal recommendations. This compromises the professional integrity of the field. Nonetheless, learning is mostly acquired through practice, or from seniors (Mezzera and Sial 2010, p. 39).

Sensationalism is a dominant feature of reporting for Urdu media journalists because they have inadequate educational backgrounds and a lack of professionalism, both of which are much needed to analyse the complex issues of politics, crime and terrorism. Their narratives are 'devoid of investigation, crammed with personal biases and based on controversies' (Mezzera and Sial 2010, p. 42). Journalists, therefore, tend to interpret issues based on their religion, gender and tradition, and this creates bias and sensationalism in their reporting. Conversely, electronic media journalists also use sensationalism, but do so for ratings and to create alternative news formats. A third category of journalists also exists: those who have good command of local languages like Urdu media journalists. Their quality of reporting is poor and full of sensationalism (Mezzera and Sial 2010).

Based on the above assessment, we further delimit local media city environmental journalists into English, Urdu and local language journalists.

PROFESSIONAL EXPERIENCE AND ROLE OF LOCAL JOURNALISTS

Professional experience working for different media environments at city level is another barometer for analysing the shared experiences of print, electronic, online and foreign news media journalists. Local print journalists have bleak professional prospects as there is no permanent jobs, no regular contracts and wage board award. For instance,

the average annual salary for a newspaper journalist ranges between fifteen and twenty thousand rupees. There is no job security; they can be sacked at any time by media management. Most often, journalists work for free and earn their livelihood by alternative means, such as blackmailing, working for state and non-state agencies and other malpractices (Eijaz 2010, p. 68). This phenomenon is known as 'brown envelope syndrome', the journalistic practice of making deals with other fellow reporters for the first-hand information, which often results 'in the circulation of planted content' (Eijaz et al. 2014, p. 49). The scenario for electronic media is better, but the image is still somewhat bleak. They have regular contracts with media organizations and receive a regular salary (Mezzera and Sial 2010, pp. 41–42).

A personal observation of local media journalists is their lack of maturity and professionalism. Instead of focusing on real social and developmental issues, they are event-driven and mostly cover political issues and controversial scoops based on scanty evidence. This may be attributed to the switching of senior journalists from print to electronic media, which occurred due to the creation of new TV news channels. This created a professional gap in print media, which has been filled by young, local journalists, who hold unrelated educational degrees and have no professional experience in news reporting. Similarly, electronic media journalists do not display professionalism and maturity because top-level management is recruited from print media, where staff have no technical knowledge and sound experience of the broadcast media format; they are often unaware of the audio and video impact on audiences (Eijaz et al. 2014; Mezzera and Sial 2010). Additionally, there are typically freelancers, having experience in providing local news to national media and international media, and public relation officers in the public and private sector, who started their career from print and electronic media and later on switched to public (state institutions) and private sector (NGOs) (Mezzera and Sial 2010).

In sum, we include environmental journalists of all ages and journalistic ranks. Our study includes respondents who have professional experience with different news formats (audio, visual, textual) and different news media organizations, and above all, who perform different roles in the media organizations, e.g. TV/newspaper reporter, radio/new agency reporter online reporter, freelance reporter, senior correspondent, editor, resident editor, city editor Bureau-in-chief, news controller, news director, head of environmental desk, public relation officer, blogger.

This information regarding the professional demography of journalists corresponds to the delimiting, selecting and interviewing phase of the multi-stage case study (more details are provided below).

METHOD: QUALITATIVE SEMI-STRUCTURED INTERVIEWS

Structured interviews are used in quantitative research and collect data in a closed format with no follow-ups; conversely, unstructured and semi-structured interviews are used in qualitative research. Both methods involve using open-ended questions followed by probes; however, structured interviews are more organized and draw on a predetermined set of questions in the form of an interview guide, and semi-structured ones are guided by the flow of conversation and participant observation, which is a tradition of ethnographic study (Gill et al. 2008). Consequently, we have chosen a qualitative method, semi-structured, face-to-face and in-depth personal interviews with participants that are designed to record 'people's knowledge, understandings, interpretations, experiences, and interactions' (Mason 2002, p. 63).

On a theoretical level, our semi-structured interview approach is based on this study's focus on the in-depth assessment of the 'reflexive' construction of reality: to analyse the experiences and events of media professionals, as retold and deemed significant by the interviewee, and provide the interviewer with access to interpersonal relationships. Accordingly, semi-structured interviews are characterized by their 'interactional exchange of dialogue in a relatively informal style to generate topic centred data interactively' (Mason 2002, p. 62). Such intimate encounters with media professionals enabled us to document their knowledge, understanding and perception of climate change, as well as their personal experiences of climate change reality and their subjective interactions with other professionals and non-professionals in a day-to-day setting. These interactions and settings shape their professional construction of the intersubjective world of climate change reality. Further, interviews allow our respondents to actively, reflexively and constitutively construct knowledge that is much needed to conceptualize the relational practices of media sociology. In brief, semi-structured interviews are the construction site of [professional] knowledge (Kvale 2007).

To assess epistemic dimensions of professional reflexivity in a transnational context, qualitative semi-structured interviews are the most appropriate methodology to collect data. Specifically, as we conduct in-depth

face-to-face interviews with media professionals, enabling them to reflect on their subjective professional rationale, lived experiences and routine journalistic relational practices.

As we propose a theoretical framework of cosmo-relational scale of actoral interconnectivity, we require in-depth accounts of valid, reliable and comparable data from different strata of journalistic practices, and this is possible only by engaging in formal interviews with professionals of all ethnic backgrounds, living in different cities of Pakistan, having different educational and professional experiences, and working for different media outlets. Additionally, this way of interviewing develops positive rapport with interviewees through the practice of active listening: the greater the rapport, the higher the generalization of data for a large population (DiCicco-Bloom and Crabtree 2006).

Table 5.1 Link between theoretical propositions and interview questions

Theoretical prepositions	*Interview questions*
Climate change is a cosmopolitan actoral relational scale of interconnectivity which exist both physically and digitally and is composed of complex, dynamic, nonlinear human, technical and digital interactions that shape the discourses of this scale Climate change is a cosmopolitan risk: Similarity of events, issues debates and policy measures Cosmopolitan actors Human, technical and digital Actoral interactions Relational scale(s) The cosmopolitan actoral relational scale of interconnectivity explains the complex underlying relational process of journalistic interconnectivity that guides the news production, presentation and reception of climate change news stories Cosmopolitan nature of climate change news story Phases of climate news story construction Idea-generation phase Developmental phase Verification and compositional phase	1. How do you understand the term 'climate change'? 2. What are the local and global issues/debates of climate change? 3. Who do you think are the key players in these debates? 4. Who do you feel sets the local and global agenda of climate change? 5. Which do you think are the key sites of the local and global agenda of climate change? 6. Which are the main issues addressed in climate change news stories? 7. How do you develop climate change story ideas? 8. What are the sources you rely on to develop climate change news stories? And why? 9. How do you approach these sources? 10. How do you get information from these sources? 11. In what ways do you check the accuracy of information? 12. How do you write a climate news story? 13. Is there anything else you want to discuss?

Semi-structured interviews also provide the flexibility to include larger variations of the sample, specifically in terms of media professionals' work experience in different environments, their educational background, linguistic, ethnic and gender difference, and above all their association with different media outlets.

Thus, a semi-structured methodology—theoretically and practically—will capture the first-hand experiences of media professionals regarding their relational practices, which are inherent in the media construction of the climate change risk. Further, it is intended to capture the ways journalists 'perceive it, describe it, feel about it, judge it, remember it, make sense of it and talk about it with others' (Patton 2015, p. 116). Before proceeding to explain the process of conducting semi-structured interviews, we discuss in detail the selection procedure of media professionals, which is guided by a chain referral sampling strategy (Table 5.1).

SAMPLING: JOURNALISTIC PROFESSIONAL NETWORK CHAIN REFERRAL

We draw on social network analysis and chain referral sampling strategy for the recruitment of media professionals. This approach is based on the assumption that professional relationships are established among journalists during their day-to-day routine, including through physical and digital interaction. Connecting with a professional attached to a network enables a researcher to gain universal access to a professional network. However, media researchers suggest that news media gatekeepers halt the process of interaction with journalists working in media organizations (Undheim 2003; Sullivan 2004, pp. 17, 30). This method of engagement—professional network chain referral strategy—facilitates access to journalists who have higher social visibility, even as they maintain busy schedules and having organizational restraints to conceal sensitive information (Bygnes 2008; Undheim 2003; Sullivan 2004).

Chain referral also allows a researcher to define members of a professional network for the purpose of identifying a study sample. In my case, the main criterion is having knowledge and experience of climate change reporting in Pakistan. A chain referral sampling method produces a study sample through referrals made among peers who possess some relevant research characteristics (Birenacki and Waldorf 1981, p. 141). In our study, the referrals come from environmental journalists who know others that share relevant research attributes. Incidentally, chain referral

has often been criticized for being a 'self-contained and self-propelled phenomenon' (Birenacki and Waldorf 1981, p. 143). However, in practice, we did not observe this. We actively and deliberately controlled the development of the chain and its termination according to the needs of our research project (Birenacki and Waldorf 1981, p. 143). From this position, we will proceed to outline the process of chain referral, which aims to yield a socio-demographic sample of relevant media professionals.

RECRUITMENT OF MEDIA PROFESSIONALS THROUGH PROFESSIONAL NETWORK CHAIN REFERRAL STRATEGY

To provide in-depth knowledge of the cosmo-relational scale of actoral interconnectivity and to conceptualize debates of media and climate change scholarship, we require information-rich and purposeful unit of observation (Blackstone 2012). In our case, these are journalists of professional networks who have an awareness and understanding of global and local dimensions of climate change and can provide their personal experiences. Furthermore, they have extensive experience of the working routines of media organizations and are therefore able to produce climate change news stories over different news media outlets. Additionally, they generate explicit, tacit, professional or occupation knowledge essential to the cosmo-relational scale of journalistic interconnectivity.

CHAIN REFERRAL STRATEGY FOR THE SELECTION OF ENVIRONMENTAL JOURNALISTS

We started our efforts to find a target population for this sample in March 2014, and finished in early April 2014. This process was lengthy because in Pakistan there is no regular climate change beat; rather, it is an additional beat given to reporters. Senior journalists specialize in politics and crime; a few know the technicalities of climate change reporting. As a media norm, environmental beats are given to young professionals who have just started their career in journalism. At some stage of their career, they will move to political and conflict reporting, which are considered key beats for building a reputation in the field. The media elite—owners and policymakers—is also not interested in it, because neither government nor the public appears to have any interest in climate change news (Yousaf 2012).

Consequently, climate change stories have no coverage on primetime television and front-page news. The main problem is also the 'very low visibility' (Birenacki and Waldorf 1981, p. 141) of climate journalists.

It is important to mention that this problem is currently being addressed: some journalists are associated with different media organizations and regularly do climate change reporting. These journalists have formed a professional network, which has an online presence (http://ncejpak.org/).

The first phase of recruitment started with finding a professional in this network who could start the chain of interviewing. The starting node of the selection process was the president of the network, a climate change reporter who has formal and informal links with other climate change journalists of the network.

To capture a comprehensive and varied picture of media professionals' relational practices, we needed to delve deep to yield a socio-demographic sample comprising of many ethnicities, educational backgrounds, professional experience, gender differences, language skills and roles within national and international news media outlets. We therefore tailored the chain referral strategy to target different groups. We controlled and directed the process by limiting the number of cases within each group in the sample. This was based on at least two considerations: first, the representativity of the sample, keeping in mind the correspondence of the sample with the actual existing population (Birenacki and Waldorf 1981, p. 157) and second, the 'repetition of the data' (Birenacki and Waldorf 1981, p. 156).

Consequently, we recruited 28 journalists from print media, 20 from electronic media and 3 media professionals from online media. The print media journalists worked for English newspapers ($n = 14$), Urdu newspapers ($n = 10$) and news agencies ($n = 4$). The electronic media journalists worked for TV news ($n = 17$) and radio channels ($n = 3$). Some of them had experience working more than two different news environments—that is, newspaper, radio, television, foreign and online media.

The process continued until we reached a sample size of 51 from a recruited population of 75 climate change journalists (Table 5.2). This size of the sample was determined by the goal of our research methodology to include environmental journalists from different news outlets, the non-availability of further respondents and repetition of qualitative data (Birenacki and Waldorf 1981, p. 157).

Figure 5.1 elucidates the chain referral sampling strategy for the selection of 51 environmental journalists (Table 5.2).
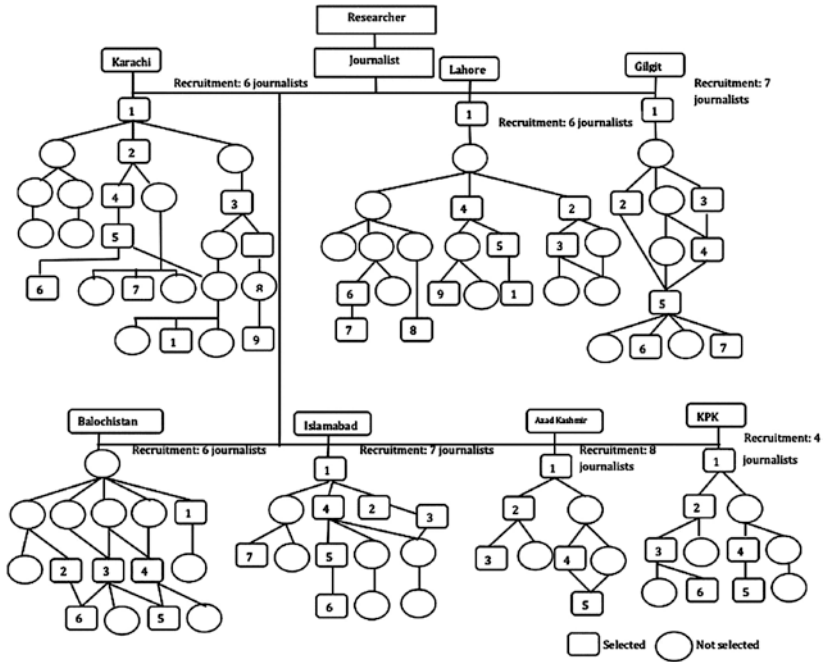
Fig. 5.1 Illustration of chain referral sampling strategy

Table 5.2 Sample size of climate change journalists

Journalist	City	Ethnicity	Language	Gender	Media outlet
10	Lahore	Punjabi	Urdu/ English	Male/ Female	Newspaper/TV Channel/ News Agency
10	Karachi	Sindhi	Urdu/ English	Male	TV/Newspaper
6	Quetta	Balochi	Urdu	Male	Radio/Newspaper/TV
6	KPK	Push tan	Urdu	Male/ Female	Radio/Newspaper/Online media
7	Gilgit	Gingili	Urdu	Male	Newspaper
5	Muzafarabad	Kashmiri	Urdu	Male	TV/Newspaper/News Agency
7	Islamabad	Mixed	Urdu/ English		TV/Newspaper/Radio/ News Agency/Online media

Method of Interpretation: Interpretative Phenomenological Analysis

The study adopts an 'interpretative phenomenological analysis'. According to Smith and colleagues:

> The aim of interpretative phenomenological analysis (IPA) is to explore in detail how participants are making sense of their personal and social world, and the main currency for an IPA study is the meanings particular experiences, events, states hold for participants. (Smith et al. 2009, p. 54)

Drawing on the professional construction of reality, IPA involves a two-stage process of interpretation. First, it reflects upon professional experiences of media officials, including their individual perception of an object, state or event related to climate change. Second, it conducts a detailed examination by analysing and making sense of the meanings embedded in the language that journalists use during the face-to-face interaction with the researcher. Guided by a professional construction of reality, according to Giddens (1984, p. 20), IPA combines a 'double hermeneutic': 'the participants are trying to make sense of their world [and] the researcher is trying to make sense of the participants trying to make sense of their world' (Smith and Osborn 2007, p. 67).

This approach allows to assess the intersubjective world of climate change reality as constructed by media professionals.

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Cosmopolitanized Scales of Climate Change Communication: Arenas, Actors and Communicative Spaces

As discussed in Chapter 2, climate change is a globalized 'risk' (Beck 1992) as it is caused by globalized interconnectivity—an outcome of industrialization and reflexive modernization (Beck 2009). However, research in social sciences and media and communication (Smith and Lindenfeld 2014; Schäfer and Schlichting 2014) conceptualizes this globalized risk—its production, construction, communication, conflicting claims, policy measures, adaptation and mitigation plans—mainly within national frameworks. Research that develops insights into new formations of 'interconnectivity' that shape discourses around the globalized risk of climate change is rare. We therefore require alternative transnational approaches, as suggested by both social science and media scholars (Rantanen 2010; Berglez 2008; Volkmer 2012a, b; Hanitzch 2012) for assessing the transnational and transdisciplinary dimensions of the globalized risk of climate change.

The parameter of such an approach should be related to theories around network society (Castells 2010), cosmopolitanism (Beck 2009), mobilities (Urry 2007), relational interactions (Crossley 2011) and reflective communicative space of public interdependence (Volkmer 2014), which all suggest the cohesion of the local national, regional and global distinctiveness into one constitutive whole.

We term this approach 'cosmo-relational scales of actoral interconnectivity', as outlined in Chapter 3. For its empirical study, we have chosen

Pakistan as a case study (see Chapter 4) and have conducted qualitative interviews with selected media professionals (see Chapter 5) of news outlets in Pakistan.

This chapter focuses on the way how journalists construct climate change as a cosmopolitan reality and interpret this reality through the cosmopolitan sphere of climate change communicative flows along three dimensions: (1) 'arenas', (2) 'actors' and (3) 'communicative space'. Together, these construct the cosmopolitan sphere of climate change communication and allow us to devise a practical model for assessing journalistic practice in the regional media of a developing country (see Chapter 7). Furthermore, these parameter might contribute to a framework for international climate change journalism research.

THE COSMOPOLITAN REALITY OF CLIMATE CHANGE

Respondents ($n = 51$) of this study who are journalists at mainstream news outlets in Pakistan have been asked for their definition of climate change. These definitions and the assumed causation are quite different among journalists and differ between scientific explanations and mythical beliefs that climate change is a punishment of God.

The majority of the respondents perceive climate change as shifts or changes in local weather patterns over a short time. For these respondents, climate change is manifested in seasonal variations, such as the lengthening of the summer season and the shortening of the winter season. As one respondent recalls in relation to the weather in Quetta city,

> almost always, after mid-February the weather used to change and the summer would start. But now winter has stretched and its spell is extended to mid-April. (Baluchistan: Interview 4, p. 1)

For more than half of the respondents ($n = 30$), climate change means extreme weather conditions, such as erratic rainfall, sudden cloudbursts, extremely cold nights in winter and unexpected rise of mercury in summer. As one respondent notes, the temperature rose suddenly in Islamabad from 30 degrees Celsius to 49 degrees in May of 2014 (Punjab: Interview 4, p. 2). It seems that overall, respondents repeatedly associate climate change with changing weather conditions and extreme weather events at the local level.

Almost half of the respondents ($n = 25$) describe climate change in terms of natural calamities like floods, droughts and rising sea levels. The majority of these respondents believe that glaciers are melting due to climate change and are causing floods in different regions of Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa (KPK). Similarly, a small number of respondents relate the drought in Sindh and Baluchistan to local climate changes. A few respondents even associate the rising sea level and its intrusion over the coastal regions of Sindh with rising temperatures caused by climate change. One respondent notes and summarizes these definitions:

> In 2010 to 2012, we faced floods every year in the Punjab, Sindh, Baluchistan, and Khyber Pakhtunkhwa. In 2014 we experience drought in Sindh and Baluchistan, and we are facing rising sea level in coastal regions of Badin and Thatta so I think when natural disasters take place and a lot of people are affected then we are shaken to reality of climate change. (Islamabad: Interview 6, p. 1)

Less than half of the respondents discuss climate change in the context of environmental pollution, and the main culprits of environmental pollution are the 'multinational corporations and local industry' (Punjab: Interview 3, p. 4), the 'public sector developmental projects' (Islamabad: Interview 6, p. 2) and the 'timber mafia' (Azad Kashmir: Interview 1, p. 4). These are involved in large-scale logging for commercial purposes and are cumulatively causing ecological changes (Punjab: Interview 10, p. 8). In brief, respondents believe that environmental pollution is a contributing factor to local environmental changes.

Only a quarter of respondents claim that climate change is a natural phenomenon and has nothing to do with anthropogenic human activities. From their perspective, human beings are sinners, and climate change is a divine punishment for their sins. In other words, the greater the number of sins, the higher the rate of unexpected weather events and disasters. These respondents think the only solution to this problem is taking refuge in religion for guidance. As one respondent claims:

> if there is any glacier lake outburst or an incident of landslide then we take it as will of God and punishment of our sins and take guidance from religious scholars. (Gilgit: Interview 6, p. 2)

In contrast to this response, three fourths of respondents feel that climate change is caused by human activities (agricultural, industrial, biological, chemical and nuclear activities), which disturb the balance of nature and initiate a chain of worldwide ecological changes. For instance:

> We [mankind] have been pumping lots of CO2 and other greenhouse gases into the atmosphere and that has caused an unnatural warming of the planet, which is manmade. (Baluchistan: Interview 2, p. 3)

In brief, respondents agree that human actions—either in the form of industrial activities or their worldly sins—are responsible for the destruction of the earth.

The above responses suggest that journalists of developing regions seem to believe in the local reality of climate change and this perception is based on their personal observation, social experience (interaction) and religious belief. As one participant argues:

> I observe these changes by myself such as extreme hot and extreme cold, other times affected communities tell me about floods … sometimes I get to learn about climate change from religious sermons before Friday prayer (Juma), which attribute such changes to human misdeeds. (Punjab: Interview 7, p. 6)

However, it is interesting that climate change is perceived in a globalized context by referring to the (1) depletion of the ozone layer and (2) global warming. Some respondents think that chlorofluorocarbons (CFC) and hydrochlorofluorocarbon (HCFC) emissions from polluting industries are increasing the hole in the ozone layer, causing ultraviolet rays to penetrate and raise the earth's temperature. Similarly, some respondents are aware of the larger globalized complexities of greenhouse gas emissions from industrial units, nuclear reactors and fossil fuel consumption, raising the earth's temperature, which in turn causes natural disasters like tsunamis, cyclones, tornados, landslides, floods, droughts, melting glaciers and rising sea levels across the globe. As one respondent notes:

> We have warmed up to 1 degree since the industrial revolution and what scientists tell us that we can warm our planet to another 1 degree … but

in reality we are heading towards more than 2 degrees—that would have catastrophic consequences for the world. (Punjab: Interview 4, p. 1)

This indicates that local journalists perceive the complex global reality of climate change. However, this perception is related to their knowledge achieved in school, scientific knowledge they aimed to gain in interaction with experts and the digital availability of scientific documents. As one respondent states:

I learned about greenhouse gases, global warming and ozone depletion in 10th grade, I usually meet with experts during local conferences and exchange information with them... Sometimes I get access to scientific research papers that depict a dismal future for Pakistan due to global climatic change. (Islamabad: Interview 3, p. 5)

The findings above document the specific combination of 'local' and 'global' risk spheres as new dimensions of dense climate change reality. The 'glocal' is perceived as a third facet of climate change reality as it merges local and global realities on the basis of similar events, issues and debates, the common suffering of people within and across the borders and above all through the intertwined relationship between local and global risk dimensions as global climatic changes are strongly seen as the cause effect of local climate changes—but also: vice versa!

Both local and global realities of climate change are constructed on the basis of similar events, issues and debates. While some correlate the 'global phenomenon of glacier melting in the arctic and Antarctica with the melting of glaciers in the Gilgit-Baltistan region of Pakistan' (Gilgit: Interview 5, p. 4), others compare the 'local phenomenon of drought of Baluchistan and Sindh' (Islamabad: Interview 3, p. 3) with the global drought of Africa, Europe, North America and Australia and allude to similar debates at the local and global level:

Being a journalist, I will say: local and international. If international debate is going on, then it becomes local debate. If overall an issue is being raised in the world, then it will also be raised at the local level- so these are relevant to each other. If America and UNO is doing it, then the same debate will come to Pakistan- so they both are relevant to each other. So what we are seeing internationally, the entire world is watching it too. (Baluchistan: Interview 5, p. 4)

Specifically, the common suffering within and across borders signifies a glocal reality of climate change:

> the people of Punjab, and Sindh (Pakistan) and Texas (USA) are facing similar kind of floods almost every year, that are incurring similar forms of human and material losses to the people living in two different regions. (Sindh: Interview 3, p. 3)

The glocal nexus of climate change is constructed through 'causal' relationships. One respondent discusses the local impact of global phenomena of climate change in these words:

> It's a global issue because every country is affected by it. It starts at the global level in the form of greenhouse gas emissions of European countries like UK, France, Italy and USA and will impact Himalayas, Karakorum glaciers, make dark clouds and create a hole over us, increase the intensity of summer season here. In this way it directly impacts us. (Punjab: Interview 9, p. 4)

Similarly, this respondent refers to global implications of local climatic changes:

> Due to the flood, many people got displaced from Swat and these people fled to different places. They were unemployed, they need food and shelter, then they went for crime too, later on they joined terrorist groups and indulged in suicidal attacks around the world. (Khyber Pakhtunkhwa: Interview 9, p. 2)

The emerging trend of global in the local and vice versa is further explained as a 'two-way process':

> Both things are there, it's a two-way process. It is a global debate and it is being localised too, and the one that is a local debate it is globalised. I have given the example of drought so many times, the drought which struck Thar. So it was delivered to the international NGOs by media, meaning that the local issue was internationalised. Similarly, the issue of carbon emissions is a global issue, so the moment we bring this phenomenon to the common man we are localizing a global international issue. So I think that it is done from both sides. (Azad Kashmir: Interview 1, p. 3)

There is a great awareness of globalized spheres of digital discourse engaging with the reality of climate change and the diversity of climate change information available on the Internet: 'the latest news of natural disasters and weather update from online newspapers and web TV' (Sindh: Interview 5, p. 10); 'early warning of unexpected climate change incidents around the globe on the web page of world meteorological organizations' (Baluchistan: Interview 2, p. 9); the 'cause-effect model of climate changes explained by the scientific blogosphere' (Punjab: Interview 9, p. 9); the 'global debates of climate changes on the official websites of UNO and its related agencies, [such as] UNFCCC, IPPC' (Punjab: Interview 6, p. 3); the 'climate change conflict between climate change activists and deniers on the online sphere' (Punjab: Interview 9, p. 6); 'climate change policies on the national websites' (Khyber Pakhtunkhwa: Interview 6, p. 5); 'statistical data about global emissions on the data portals of the World Bank and BBC' (Sindh: Interview 5, p. 11); 'climate change activist campaigns over social media (Facebook, Twitter and YouTube)' (Islamabad: Interview 1, p. 4). Furthermore, hyperlinks easily connect local web pages to global ones (Azad Kashmir: Interview 1, p. 5). In brief, all climate change-related information is available over the digital sphere and can be easily accessed by people from different cultures, religions and political and economic systems. These responses therefore illustrate the digital reality of climate change as well.

Climate change is also understood neither as national nor transnational. Rather, respondents emphasize the intertwined local, global and glocal risk spheres addressed in digital discourse dimensions of climate change. Furthermore, such a risk reality relies on the similarity of real-world incidents between the core (global) and periphery (local).

When taking this debate further, it might be useful to address (1) where and how this risk reality is constructed, (2) what/who are the actors that construct this reality, and (3) how this reality is communicated. To this end, respondents perceive three parameter: (1) arenas, (2) actors and (3) communicative spaces, which altogether build the conceptual sphere of cosmopolitan climate change communicative flows. Such a framework might help to address different dimensions of the cosmopolitan reality of climate change.

EPISTEMIC 'ARENAS' OF CLIMATE CHANGE ISSUES

In contrast to the traditional approach of constructing climate change reality within national boundaries, the findings of this study reveal different intertwined epistemic 'arenas' (Hilgartner and Bosk 1988) as the construction sites of the cosmopolitan reality of climate change. The majority of the respondents interviewed perceived local, global and digital arenas as ideal locations to construct a cosmopolitan reality of climate change along thematic axes of signs, events, issues, debates and solutions.

Constructing Climate Change Reality Within a Localized Arena

Almost all journalists refer to the local as an important arena for the construction of climate change: 'local' refers to the specific area where they live and work, such as neighbourhood, village, district or province where all climate-related activities take place. For example, one respondent explains the local arena in these words:

> Local is where I live and work, where my relatives live, where we see changes in our weather, where we face climate effects like glacier melting, floods unusual rain falls and drought… where local experts informs us about the causes and impact of climate change on our local environments, where industrialists and multinationals are polluting our local surroundings, where climate change activists and non-government organisations engage in climate related debates and launch public awareness campaigns, where the provincial government pass bills on climate change and draft local policies, where local government machinery implements the policies, where the local media report all the climate incidents, local issues and debates to the public …. (Azad Kashmir: Interview 1, p. 3)

This suggests triangular axes of events, issues and debates that are used to construct climate change reality at the local level. The first axis—as perceived by respondents—is constituted by the local events of climate change. Almost all respondents believe climate change is 'happening' locally. To support this, they refer to real-world events of local climatic changes, like glacier melting in Gilgit-Baltistan, floods in Sindh, Punjab, and Khyber Pakhtunkhwa, drought and rising sea levels in Sindh and Baluchistan, and changing weather conditions such as shifting rainfall

patterns, longer seasons and rising temperatures across the region. As one respondent states:

> The cold is intense in some areas and in other areas the heat is intense, sea storm comes, there is cataclysmal in rivers, and there are chances of floods and earthquakes… Our many landowners of Baluchistan have been affected by this climate change and their 30-year-old gardens, like apple gardens, almond gardens, have been adversely affected due to no rains and drought…The intensity of heat in some areas like Quetta, before here used to be intense cold and its span was more, but now the heat is more intense and summer is for a long span. (Baluchistan: Interview 3, p. 1)

The above quotation suggests that local events and incidents provide the means to construct the reality of climate change within the local arena. However, they are not sufficient evidence for constructing the reality of climate change within the local arena, unless they are related to local climate problems.

This brings us to the second axis of constructing the reality of climate change through local issues. To this end, respondents of all regions refer to the frequent floods that Pakistan has been experiencing every year since 2010. For instance, a respondent from the province of Khyber Pakhtunkhwa says:

> In 2010 we experienced the worse flood in our recorded history and then again this year such floods came in Pakistan, which have damaged many areas. (Khyber Pakhtunkhwa: Interview 2, p. 1)

Almost all respondents point out that Pakistan is a forest-poor country because trees are being cut down ruthlessly for cooking and heating purposes in the northern areas, like KPK and Baluchistan, for housing schemes in Punjab and Sindh, for agricultural land in Punjab and Sindh, for heavy industries in Punjab, Sindh, KPK and Baluchistan, and for the metro bus project in Punjab (Baluchistan: Interview 6). Such rapid deforestation, they believe, is raising temperatures in local areas, melting glaciers and causing floods (Islamabad: Interview 2). More than half of the respondents note drought as a third major issue for Pakistan. As one respondent says, drought in Tharparkar and Cholistan areas of Sindh seriously affected the local people and increased the death rate (Islamabad: Interview 7).

Water scarcity is seen as the most serious issue that local residents face and consider Pakistan a water-stressed country (Baluchistan: Interview 1). Respondents are of the view that disturbances in the cycle of seasons, rapid snow melting on the northern mountains, glacier melting in the Himalaya ranges and frequent flooding are depleting the natural reserves of water and creating water shortages for human and agricultural needs. They believe the water table has been lowering in the Punjab, Sindh Baluchistan and KPK region, which is affecting crops and the availability of freshwater for drinking purposes.

In addition, more than half of the respondents consider environmental pollution to be an important cause of climate change in different regions. Industries and factories, overpopulation, but also developmental projects, the transportation sector and consumer culture are rapidly changing the local environment. A majority of the respondents blame rapid industrialization by local and foreign investors for local climatic change. Industrialization of this type, it is argued, is increasing the rate of greenhouse gas emissions like chlorofluorocarbon and hydrochlorofluorocarbon. Furthermore, it is emphasized that industrial waste is 'dumped' into the water streams without using clean technologies. Government departments and agencies have no proper monitoring mechanisms to check the degradation of the environment by industries and factories (Sindh: Interview 1).

Some respondents indicate that an increased number of cars, use of carbon fuels and nuclear radiation from the nuclear power plants are damaging the ozone layer and raising mercury levels. A few respondents hold developmental projects responsible for climate change. Others even comment that unchecked population growth is causing degradation of the environment, and no attempts have been made to curb it (Islamabad: Interview 2). Almost all respondents agree that environmental pollution has raised the temperature of local cities. Due to pollution, the temperature of big cities like Lahore and Karachi remains high (Sindh: Interview 3).

A quarter of the interview partners ($n = 13$) relate health issues to climate change. Climate-induced disasters like floods in Punjab, Sindh and KPK cause waterborne diseases like typhoid, cholera, and hepatitis and vector-borne diseases like dengue and malaria (e.g. Sindh: Interviews 3, 5, 7). Others maintain that people in Baluchistan are facing health issues like malnutrition and chronic, infectious diseases due to drought (Baluchistan: Interviews 3, 6). Taken together, these testimonials are

ample evidence of constructing the reality of climate change at the local arena.

The above findings indicate that local journalists 'knit' together 'events' and 'issues' to construct and contrast their reality of climate change; however, such constructions are not complete without the thematic axes of climate change debates. In other words, phenomena and 'issues' lead to local debates about climate change, which vary from region to region.

We will subsequently summarize the debates in different regions of Pakistan from the perspective of local respondents in the environment field.

In the first instance, we refer to respondents from Balochi, who highlight different local debates from their specific area. The majority of them note the debate surrounding the scarcity of water for human and agricultural needs due to poor rainfall, floods and the building of dams by India on the Indus River (the only source of water for the people of Baluchistan) (Baluchistan: Interview 3). This is followed by a large number of respondents who claim that in Quetta the most pressing issue is rising temperatures due to less rainfall, decreased snowfalls on mountains and longer summer seasons.

This results in health issues for the population of Balochi, affecting their crops (Baluchistan: Interview 6). More than half of the respondents think that recent drought due to deforestation and environmental pollution is the most pressing issue at the local level. Less than half of the respondents claim that environmental refugees fleeing from rising sea level and floods, and decreasing of mangrove trees over the coastal region due the sea intrusions, are the pressing topics for the public and private sectors working in the Baluchistan.

In the second example, we refer to respondents from the region of Khyber Pakhtunkhwa (KPK). They argue that the most debated issue in this region is the large-scale cutting of trees due to urbanization, which causes changes in rainfall patterns. As one interviewee states, 'greenery in the tribal areas and in the northern areas are also depleting due to deforestation' (Khyber Pakhtunkhwa: Interview 2). A large number of respondents refer to debates over the human and material losses incurred by floods every year in different areas of KPK. One respondent recalls the fact that in the Chitral Valley during the last five years many villages have disappeared because of Glacial Lake Outburst Floods (GLOFs). Many people have been rendered homeless, and there have been a

number of casualties. A small number of respondents from the region referred to local debates about the American war on terror and drone attacks on different regions of Khyber Pakhtunkhwa—these attacks, they argue, have raised the local temperature in recent years (Khyber Pakhtunkhwa: Interview 5). A few respondents highlight discussions around environmental pollution caused by transportation and the industrial sector, to which they attribute local climate changes in KPK (Khyber Pakhtunkhwa: Interview 5). Notably, KPK respondents link local debates to climatic changes in the province.

In the third instance, we discuss the observations of respondents from Gilgit. For the majority, the most debatable issue is glacier melting, which is affecting local communities experiencing floods, water shortages, soil erosion and low-yield crops (Gilgit: Interview 3). Another ongoing debate that is a major concern for Gilgit respondents is deforestation. Major forests in the district of Diamer and in parts of the Gilgit region are being cut down by local communities to meet their heating needs amid changing weather conditions. Consequently, natural forest is rapidly depleting and illegal cutting is at its peak. More than half of the respondents link low agricultural productivity debates to climate change in Gilgit-Baltistan (Gilgit: Interview 3). A few respondents also refer to debates over the Siachen war (India versus Pakistan) and developmental projects (construction of Karakorum Highway) as major causes of environmental change in the area (Gilgit: Interviews 3, 5).

In the Punjab region, the most pressing debate is the lack of water due to climatic change. Respondents highlight a number of local debates about the impact of water shortages on livestock, agricultural production and clean drinking water. There are also gaps in governmental environmental efforts to counter the challenges of water scarcity—specifically through the construction of dams on the rivers flowing to areas of Punjab from the Himalaya region. As one respondent critiques, 'Water scarcity is also discussed and debated at various forums but there are no actions in the field' (Punjab: Interview 2, p. 2). For some respondents, all local debates revolve around the floods, their causes and effects in terms of human and financial losses, and criticism of local government disaster management procedures and their ground-level implementation. For instance, the worst floods occurred in 2010; they broke records from the last 40 years and washed away crops and localities over acres of land (Punjab: Interview 2, p. 2). For other respondents, there are also other flood-related debates, like low agricultural productivity, mass migration

and resettlement issues after flooding, and the future risk of food security (Punjab: Interviews 4, 8, 10).

Among the Punjabi respondents, the most heated debate is on developmental projects that cause environmental damages. They think that local governments do not consider the environmental aspects of developmental projects. For example,

> whenever the government launches a major project they are bound to see the feasibility of the environment, but all governments always neglect this issue, like the metro bus mega project in Lahore where the government totally neglected the environment issues. (e.g. Punjab: Interview 5, p. 3).

A small number of respondents consider rising temperatures in Punjab due to industrial emissions, nuclear waste, vehicle emissions and terrorist activities as the climate-related issues of the province (e.g. Punjab: Interview 8). An equal number of respondents also argue that deforestation due to rapid urbanization, local governmental failures in urban planning and the extension of housing societies contributed to rising temperatures in Punjab over the last few years (e.g. Punjab: Interview 10).

Correspondingly, from the Sindhi respondents, the most pressing issues are: rising temperatures, floods, drought, rising sea levels and the decreasing population of mangrove trees. For instance, one interviewee discusses drought and floods at length:

> Due to this increase in temperature you see floods and drought. In some places we see floods and the evaporation that is taking place so rains happen. Last year you noticed that massive destruction happened in Sindh due to rain, before this we saw it in the floods of 2010; one of the reasons behind it is all these situations. Now, last year we saw the drought which came in Thar and because of it we lost many lives there, and the people migrated from there. (Sindh: Interview 2, p. 1)

Alternatively, other respondents discuss rising sea levels near the shore of Karachi and the large-scale migration of the affected people:

> Because of sea intrusion, a major portion of the population of Jati, Keti Bunder, Shah Bunder and Kharo Chan is affected and the population suffers an intense pain as they are left with no option other than to displace themselves and migrate. (Sindh: Interview 10, p. 2)

Apart from issue-specific debates, a large number of respondents identify event-based debates that emerge due to real-world events like floods and droughts that are specific to local areas. As one Punjabi respondent argues:

> Three years back when I told you about an artificial lake found in a river in the Pakistan mountain area of Hunza, the debate was about river towards mountain and climate change and their impact. Then there were super floods in Pakistan in 2010. The debate was around floods and climate change. Then if you have heat wave the debate will turn to heat wave and climate change. So, it's always abrupt switching on from one problem to another in Pakistan and literally nobody is trying to resolve these problems. So, the debate in Pakistan is always event-based. (Punjab: Interview 1, p. 6)

In addition, a few respondents identify the routine debate between civil society organizations and polluting industries, which sabotage the process of climate change policy, the enactment of rules and regulations and the necessary actions for its implementation. As one respondent puts it:

> Then there are industrialists, big corporations—because mostly the danger of climate change is because of them, therefore they should be made aware [of this]. So whenever any agenda of this sort is being set by civil activists, then they necessarily intervene, lobby, and try to include/bring in their own will. So when any debates are held on this agenda then they strive [to prevent] people from tweeting about it. It is the biggest issue at local and global level that multi-national corporations and other local industries do not let the debates on this get mature. (Punjab: Interview 7, pp. 3–4)

According to respondents from Islamabad, the metro bus project is the most debated local issue. They believe that state machinery did not get the approval of the environmental protection agency. They also think the project almost changed Islamabad's weather and made it extremely hot—for which they blame the large-scale logging. From respondents' perspective, social activists are using the media to bring attention to the issue, but the political elite is not entertaining the idea of preserving forests in Islamabad at the cost of this developmental project.

On the same line, a few respondents highlight the proposal of coal fuel projects to meet the energy crisis of the country. They think that the

world is moving towards clean technologies, while we are going back to dirty fuels. As one respondent states:

> This government is now trying to convert to coal and is trying to set up all these coal power plants …they don't realise that global powers are going for an agreement next year in Paris to phase out coal fuel energy production till 2020. We started building coal power plants in 2014, this year, and they won't be ready until 2018 or 2019, or possibly 2020. (Punjab: Interview 7, p. 2)

In brief, the above discussion suggests that local journalists use triangular axes of images and symbols, issues, events and debates to construct the reality of climate change within the local arena.

Constructing Climate Change Reality Within a Globalized Arena

In addition to these distinct local perceptions, respondents also perceive the construction of climate change as occurring in the global arena, through the rectangular axis of (1) worldwide climate change-related events and incidents, (2) transnational climate change issues and (3) prevailing climate change discourses at the international level and their possible (4) solutions. For them, everything that is beyond their personal reach and personal experience and is faced by others is 'global'. For instance:

> global is what is faced by other countries' people … what is discussed on UN platforms, what is contested by the European Union, USA, China and India, what is covered by global media, and the issues of global warming, ozone layer, glacier melting, rising sea levels and hunger and poverty, and above all the policy measures of global bodies like IMF, UNO, WTO like reduction of greenhouse gas emissions and carbon credit schemes. (Azad Kashmir: Interview 1, p. 3)

Almost half of the respondents seem to perceive the global reality of climate on a specific axis of climate change-related events. They consider real-world events and disasters, such as glacier melting in the Arctic and Antarctica, rising temperatures in the Middle East, the weakening of the ozone layer over Australia and New Zealand, earthquakes in Japan, drought in Africa, tsunami in Indonesia and America, and floods

in India, Bangladesh, USA, China and England, as the signals of global climatic changes (e.g. Punjab: Interview 7).

All these suggest that local events and disasters in different parts of the world are used as symbols and images to construct the reality of climate change in the global arena; however, this is not limited to the axis of signs. Rather, it also includes two further axes, i.e. transnational climate change-related issues and debates, for the construction of its reality. As one media respondent claims,

> It is an unusual happening, accident, incident, natural disaster or human impact of climate change that gives rise to issues and debates of climate change. (Punjab: Interview 4, pp. 3–5)

The second thematic axis in the global arena deals with transnational issues, which are the direct outcome of climate-induced disasters and changes around the globe. Media respondents label global warming as the most pertinent issue of current times. As one respondent states,

> I think… the global warming is the basic issue which is causing the climatic changes and in this part of the world especially South Asian region the glaciers, they are melting down and causing problems… floods are caused by these melt down of the glaciers. Water resources are depleting. (Islamabad: Interview 2, p. 2)

This is compounded by issues associated with the depletion of the ozone layer. According to one respondent,

> The ozone layer … is also another major issue of the world, all of the layer is breaking down and due to this the earth is facing intensity of heat from the sun and ultraviolet radiation. (Punjab: Interview 3, p. 3)

Also, a large number of respondents refer to global emissions that cause changes in the environment as an important issue. For example, a respondent says:

> Global issues include green gases; all of the industrialised nations are included in this. Like, America and China they are the main culprits, and many other countries too, from where this green gas is expelled. (Sindh: Interview 3, p. 2)

Respondents also mentioned rising sea levels all over the world, specifically in Antarctica and the polar region (Baluchistan: Interview 1).

Apart from this, the majority of the respondents feel that the issue of water scarcity assumes utmost importance in the twenty-first century, as all countries across the globe are experiencing a decline in water availability for agricultural, domestic and industrial needs. Decreasing rainfall means underground water is not being replenished and river flows are decreasing (Sindh: Interview 5). For some respondents, the world is witnessing an ever-increasing trend of floods (Azad Kashmir: Interview 3).

Some interviewees relate the climate change issue to geopolitical structures and note that America's global 'War on Terror' and the use of weapons of mass destruction against extremists in Iraq, Afghanistan and the Pakistan tribal belt have disturbed local environments and communities (Islamabad: Interview 5). Others respondents linked nuclear proliferation with global climate change (Sindh: Interview 6). The above findings suggest that different regional issues are points of reference to construct the global reality of climate change.

In addition to climate change-related events and issues, global debates are the third axis to interpret the global reality of climate change. Internationally, a number of climate change issues are highlighted by media respondents. A number of respondents refer to the global debate about the climate change reality. Climate devotees (supporters) include scientist activists, NGOs, international bodies like the UN and state actors; they float the idea of climate change by giving real-world examples and models of changes in the global environment. Alternatively, sceptics—such as a small number of scientists, the coal fuel industry and multinational corporations—challenge the reality of the idea by quoting examples and models of the non-existence of climate change, or they label it a natural process with benefits. This debate is being waged in physical and digital spheres and is diluting the faith of the global public in climate change (Punjab: Interviews 4, 7, 9).

It is interesting that more than half of the respondents refer to the global debate and address the real culprits of global climate change. Respondents think that developing countries are shifting the burden of responsibility towards advanced nations on the basis of their major contribution in global greenhouse gas emissions. Furthermore, they are not willing to forsake their development by reducing carbon emissions. Rather, they demand more effort on the part of developed countries to reduce greenhouse gas emissions. This creates a deadlock and delay in

global efforts to tackle climate change (Punjab: Interview 7). As one respondent states:

> So the countries who are producing more environmental pollution, the biggest ones among them, the USA and China, have not signed the Kyoto Protocol and other agreements and then they criticize other countries and say that these environmental changes are coming from them and that they should stop it. (Punjab: Interview 3, p. 2)

Almost half of respondents discuss the global issue of carbon trading schemes. Some respondents consider it an unfair scheme for developing countries because advanced countries 'will get credit of reducing emissions by shifting the polluting industry to the underdeveloped regions' (Islamabad: Interview 2, p. 5). For other respondents, it is a beneficial scheme for countries like Pakistan who are contributing only traces of global industrial emissions: 'Simply selling their carbon credit will help to boost the delivering economy' (Punjab: Interview 5, p. 6).

Apart from worldwide events, issues and debates, solution-based policy measures are the fourth axis to construct the global reality of climate change. A small number of respondents refer to the debate over the global reduction in the use of coal to produce electricity and petroleum products. There are suggestions of its complete phase out in stages, and the development of alternative means to meet the energy demands of a global economy. As one participant comments, 'In 2020, if a country makes electricity using coal without filters it will be internationally fined' (Punjab: Interview 6, p. 2). A few respondents even refer to discussions over the dumping of nuclear waste by the nuclear powers and its impact on the ecosystem, as assessed by scientific institutions and world bodies (Azad Kashmir: Interview 5, pp. 2–3).

The above discussion indicates that signs, issues and debates and policy-based solutions are interlinked and frame a rectangular axis that constructs the climate change reality within the global arena.

Constructing Climate Change Reality in the Digital Arena

In parallel to the local and global, more than half of media respondents, who are aware of the digital communication landscape, also referred to the digital arena—a parallel mode of constructing climate change reality

along the intertwined pentangular axis of (1) signs, (2) events, (3) issues, (4) debates and (5) solutions.

When asked to explain the digital arena, a large number of respondents consider the Internet a digital arena because it is created by digital computer networks, which are free from time and place constraints, and connect millions of people across the world. However, few respondents interrogate the universal access to the Internet and the growing digital divide. As one respondent argues:

> Only two per cent of the Pakistani population has access to the Internet … the majority of Pakistani people live in rural areas; they even do not have electricity … the national language is Urdu while the language of the internet is English. (Khyber Pakhtunkhwa: Interview 4, p. 6)

In contrast, a small number of respondents consider the World Wide Web as a digital arena. For them, all climate-related information—including unusual weather signs, extreme world events, issues, debates and policy measures—is available on web pages that are interlinked. In brief, respondents equate the digital arena with Internet and Web 3.0 that are the spaces to construct a cosmopolitan reality of climate change. Respondents categorize the digital arena further into sub-digital arenas depending on the nature of climate change information (signs, events, issues, debates and solution) they provide to their users.

The most important and reliable sites for a majority of the respondents are the official websites of the UN and its allied agencies as web portals for all climate-related information.

> The latest synthesis report about climate issues and the latest information is also provided on the web portals of different international organizations like the UNDP, the United Nations Environment Program, the United Nation Framework Convention on Climate Change, Intergovernmental panel on climate change … these organizations publish periodically and annually information on climate change that can be the best source of information for people of all walks of life. (Sindh: Interview 5, p. 7)

Respondents also believe that web pages of state institutions are the key hubs of local climate change information. For instance, the web page of the Climate Change Ministry includes the details of public sector development projects about climate change, state policy, publications,

databases, news about the current activities of the ministry and links to related departments and allied national and international organizations. For instance:

> There are various official websites working on it [for example] the Climate Change Ministry, Environment protection agency, and the NDMA [National Disaster Management Authority]. Apart from this, if we look at the provincial level, then the PDMA [Provincial Disaster Management Authority] can give you a lot of information, there are many state departments from where we can get this information. (Khyber Pakhtunkhwa: Interview 6, p. 6)

The digital presence of local and international non-government organizations keeps them abreast of local and global climate change events, issues, and debates and policies. Additionally, information about the climate-related projects of these organizations is relevant specifically when setting the agenda for public awareness campaigns:

> I can say that IUCN has dedicated an open space to climate change on its website, including its agenda of nature-based solutions, news details of its nature conservation projects in different regions of the world, a directory of open access journals and its world conservation magazine. Having all information on one site makes it easy for us to get climate change information whenever we need it. (Gilgit: Interview 3, p. 5)

Almost half of the 51 journalists interviewed consider scientific websites the main source for constructing the climate change reality. These are often sites which explain climate change phenomena and provide detailed information about causes and overall effects. Furthermore, they debate and contest the reality of climate change through scientific models and approaches, and communicate their research findings in the form of e-papers, online research articles and e-books embedded with their websites. For example:

> We try to search the data prepared by experts on the websites of scientific research centres and institutes. There are links to the research studies that they have uploaded. Secondly, they document it and they make a portal on their websites and put them on it—and then we download it, so usually it happens in this way… NASA is good example. (Khyber Pakhtunkhwa: Interview 3, p. 6)

In addition, online news media are seen as an important arena in the construction of the cosmopolitan reality of climate change. In the perspective of respondents, online news media sites such as online newspapers and web TV construct the global reality, particularly in terms of weather forecasts like the rise and fall of temperature in the next 24 hours; planned and organized events (such as international conferences and summits on climate change and World Environment Day); unusual events like tsunamis, floods, famine and earthquakes; reports on local issues (like the extinction of snow leopards in the Himalayas); and green debates like the signing of the Kyoto Protocol by powers like the USA and China. As one respondent points out:

> The international news websites specifically that are related to environment—I can rely on them. [For example] the BBC, the *Washington Post*, the *Daily Mail* … the *Telegraph*, the *Guardian*, the CNN, the AP…all these big agencies- we follow them. They have special pages and sections on climate change issues, and policy debates. They update me about any event or disaster of climate change taking place in any corner of the world. (Sindh: Interview 9, p. 7)

Only a small number of respondents argue that social media is an important digital arena for distributing climate change information through social networking sites (like Facebook or Twitter), YouTube and the blogosphere. Furthermore, these respondents believe that social media is an alternative platform because it provides climate change information in an easy and understandable language for people who have no time to go to climate-related websites or understand highly scientific, technical and scholastic language. According to respondents, social media is an interactive platform for people due to the sharing of sounds, images and text about climate-related disasters, issues and debates. However, the majority of the respondents think that social media is mostly used to communicate the sufferings of people affected by climate-induced disasters like floods and drought around the world: 'People often tweet or update their status to inform people and authorities about the incidents' (Gilgit: Interview 6, p. 3):

> Some activists and some organisations working on climate change issues, including the UN panel on climate change and its body, have own Twitter accounts. (Punjab: Interview 9, p. 24)

A small number of respondents refer to climate change pages on Facebook, where diverse people, like experts, social activist, sufferers and journalists, interact and discuss environmental issues. On these Facebook pages, solutions are also discussed (Islamabad: Interview 1, p. 5): 'Our friends created a Facebook page for the National Council of Environment Journalists, where all the local issues of climate change are highlighted' (Islamabad: Interview 1, p. 5).

However, these pages are seen as limited in number and serve the interest of the page creator, who could be an individual or organization. Furthermore, their followers are only people working or researching in the areas of climate change. As is argued 'people are more interested in juicy, scandalous news about celebrity and politicians rather than debating climate change issues' (Lahore: Interview 3, p. 4).

A few respondents identify the climate science blogosphere to be an important digital podium to inform and debate on climate change issues. As one respondent states,

> Whenever I do a story on climate change… I get my information through climate science blogs. There are blogs on climate change by scientists, sceptics, activists and senior analysts from different fields. They all enrich my information of climate change. (Punjab: Interview 1, p. 13)

However, a few respondents believe that many blogs maintain a sceptical position, forming an alternative blogosphere in which a different version of climate change reality is constructed. Such blogs, respondents feel, provide solid evidence of the non-existence of climate change, and this creates doubt and misleads people in search of information. For instance, one respondent claims that: 'I found so many blogs of a climate sceptic, they explain that climate change is a normal phenomena and glaciers are not melting due to global warming' (Khyber Pakhtunkhwa: Interview 1, p. 7).

To sum up the above discussion, it can be argued that the digital arena constructs a cosmopolitan reality of climate change through inter-linked pentangular axes of climate change signs, events, issues, debates and policy-based solutions.

It seems reasonable to argue that the local, global and digital are parallel arenas in constructing the climate change reality along thematic axes of signs, events, issues and debates. However, at certain times, these axes become interlinked and form what we label the 'gloco-digital arena' of

climate change reality. A large number of respondents think that in most of the cases, a single event, issue or debate of climate change can connect local, global and digital arenas. For instance:

> During the floods of 2010, the Pakistani army, government departments, social and religious worker, local non-government organisations came to the aid of large number of affected people. International organisations also joined the relief activities, different nation states sent their response team to the affected areas, local media highlighted the sufferings of the people, transnational media relayed the sounds and images of the causalities sometimes directly from the national and social media, sometimes through their local correspondents. The Pakistani diaspora all around the world launched relief fund donation campaigns over Facebook. (Punjab: Interview 1, p. 9)

The above response suggests that local, global and digital arenas altogether form physico-digital arena for the construction of climate change reality.

Perceiving Climate Change Actors in the Cosmopolitan Sphere of Climate Change

Taking this debate further, it might be useful to explore the actors involved in constructing the cosmopolitan reality of climate change. In contrast to the traditional approach of conceptualizing actors within the nation-state framework (Beck 2009; Castells 2008; Held 2010) and theories of globalization (Robinson 2009; Held and McGrew 2007; Ritzer 2008; Axford 2013), the findings of this study point to the cosmopolitan nature of climate change actors by examining their local, global and digital presence.

When asked 'who are the actors of climate change?', respondents refer to both 'human' and 'technical' actors. The majority of the respondents perceive human actors as the primary actors involved in the construction of climate change. To counter the current and future challenges of climate change, they are engaged in activities such as developing models of climate change impact and devising policies and strategies for human adaptation to climate change and mitigation of climate change effects.

A small number of respondents refer to 'technical actors' that are material objects and are non-human in nature. Existing research on media and climate change makes no reference to technical actors as

playing an important role in the construction of the social reality of climate change. Such actors, respondents argue, interact with social actors to construct climate change reality in the cosmopolitan sphere. This might include research documents, policy papers, video recordings, scientific equipment or computer technology as Latour would argue, these technical entities do 'things' or 'acts' (Latour 1992, p. 241). One respondent illustrates the role of technical actors:

> Scientific research organisations who are doing research in scientific laboratories and are using high speed computer technology on climate change programs, publish their work in the form of articles, models, research papers, books and communicate it through digital media like internet, TV, radio, and online newspapers. (Khyber Pakhtunkhwa: Interview 4, p. 4)

This response suggests that technical actors hold an important place in the cosmopolitan sphere of climate change, and without their effective participation, a smooth flow of information about the issues, debates and policies relating to the globalized risks of climate change is not possible in any direction, from local to global or vice versa.

Perceiving Local Actors of Climate Change

Respondents of the study enlist governmental bodies, non-governmental organizations, academia, industrial sectors, media, public and scientific and religious institutions as the local actors of climate change politics.

The most important of all, as noted by interviewees, constitute political actors (Newell 2000; Cottle 2000; Hansen 2010; Lester 2010), which include state, politicians, parliamentarians, policymakers, decision-makers, planners and implementers, and monitoring authorities. It is the political, civil and military elite who initiate debates on climate change and make rules and policies in the legislature, which they implement and monitor through the executive and judiciary, respectively. As one participant argues:

> If you talk about national stakeholders and key players, then the state is the major player and actor too. If any policy is introduced related to the environment or climate change, it is done in the legislature and the Climate Change Ministry … its implementation is done by the executive, and affiliated institutions like environment protection agency, green

courts, disaster management authorities, local governments, and meteorological departments and agriculture council. (Khyber Pakhtunkhwa: Interview 6, p. 7)

However, overall, there is a belief that Pakistan is only paying lip service to the international community and in reality is not making any effort to handle the current challenges of climate change (Gilgit: Interview 3). The government established the Climate Change Ministry with the sole purpose of gaining foreign aid from developed countries and the United Nations, while masquerading as a sector development project. For these respondents, state machinery is engaging with the war on terror, the dwindling economy and the energy crisis, which means there is no scope to prioritize climate change. One respondent notes the importance of climate change in the eyes of the government:

> They have other political issues to talk about. Their agenda is mostly political and then whatever left is finance and business, that's it, nothing more, nothing less. 60 per cent is politics, 40 per cent is economy. No place for climate change issues. (Islamabad: Interview 6, p. 2)

Besides, the government has limited resources in terms of capital and information, which are needed to inform people about the immediate and future impacts of climate change and to launch sustainable projects (e.g. Gilgit: Interview 1; Islamabad: Interview 7). State machinery becomes active only when a natural disaster takes place or an issue of a serious nature, like water scarcity and food insecurity, affects a large number of people (e.g. Baluchistan: Interview 2; Gilgit: Interview 1).

Some respondents criticize the government for their abolition of the Climate Change Ministry and its transfer to provincial governance, owing to the 18th amendment. This is in contrast to developed countries, where climate change is the concern of federal administrations (e.g. Islamabad: Interview 6). However, a small number of respondents note that frequent flooding since 2010 and long droughts in Sindh and Baluchistan made the government aware of the gravity of the situation. After these climatic events, they initiated debates and formulated the first national policy on climate change (e.g. Islamabad: Interview 3; Baluchistan: Interview 5). According to respondents, the national policy is a replica of the global policy on climate change and does not reflect the local context (Islamabad: Interviews 2, 4). A few respondents

blame the state for carrying out development projects without any approval from the established department of environmental protection; this agency is responsible for granting clearance certificates to projects that have no significant effects on local environment and people. As one respondent notes:

> We have also seen that government itself is sometimes taking such steps which are against our climate and environment like exploding the confiscated explosive from the Sust Dry port near Karakorum National Park, which is against the nature and wildlife. (Gilgit: Interview 4, p. 8)

An equally important actor are non-government organizations (Anderson 2009; Hansen 2010; Lester 2010; Cox 2013). According to respondents, the SDPI, Oxfam and LEADS are the leading climate change NGOs in the private sector. It is argued that climate change NGOs serve the foreign agenda as they are sponsored by the global powers (USA, European Union) and global bodies (the UN and the World Bank):

> We think that [NGOs] eat away all the funds for free, and they run by carrying some foreign agenda with them. Unfortunately, the impression of our media is also that climate change is not an international issue but a foreign agenda, although we are the ones who are being impacted by it the most. Here the understanding is that it is a foreign agenda, which is being implemented through NGOs. NGOs move on by carrying their agenda. So, that is why this sector is ignored the most. (Sindh: Interview 4, p. 2)

For some respondents, NGOs are engaged in drafting climate change policy in collaboration with state governments; others believe they are launching public awareness campaigns and implementing adaptation and mitigation projects as directed by the foreign donors. For instance,

> Actively, NGOs usually have funds from UNO and its allied agencies for at least small-scale projects that they can do on a pilot basis in different parts of the country. These might be the projects related to advocacy, they tell people about climate change and raise awareness … or these might actually be service-related projects where they intervene and they help people learn ways to adapt and mitigate the adverse effects of climate change. (Punjab: Interview 9, p. 5)

In addition, international NGOs are seen as anti-nationalist, following their hidden agenda of spying on nuclear installations in Pakistan on behalf of the global powers and their undercover missions against the Taliban in the northern areas of Pakistan. Respondents referred to the NGOs that were shut down over the last five years because of their anti-state activities. For instance,

> You see Shekel Afridi of the CIA took money and they sent polio activists to Osama Bin Laden's house and took blood samples of the children along with it. Now as a result the Talibans, who are terrorists and bad people, refuse to take polio drops because they believe them to be spies. They killed 51 innocent women of this campaign who had come to give polio drops… who is responsible for this… the USA. (Azad Kashmir: Interview 6, p. 8)

It is claimed that owing to the absence of external monitoring mechanisms, there is no transparency or means to assess whether NGOs are performing their role efficiently in the domain of climate change. This leads to rampant corruption in these organizations. Consequently, they are not doing any constructive work in the field but rather submitting progress reports directly to their global partners and using the media to advertise their activities and achieved milestones (Sindh: Interview 6).

Unlike to social and media research where the national public sphere is seen as a core component of risk debates (Cottle 2000; Lester 2010; Schäfer 2012), only almost half of respondents in this study consider the public as the most important of all local actors. The public despite being undermined is seen as the real victim of climate change. As one respondent says:

> I think that the public is the number one stakeholder; their life is being affected, whether they are fishermen, farmers, peasants, labourers, clerks, doctors, engineers, cleaners or the people from any other walk of life who face climate change impacts. (Sindh: Interview 1, p. 4)

Almost two thirds of the 51 participants pointed out that the public has neither awareness nor interest in climate change. As one respondent feels, 'People watch it less as they don't have awareness and interest in it' (Karachi: Interview 6, p. 6). Similarly, another interviewee reports:

> Because the climate change issue is no news for the media in Pakistan and people have also no interest, and they also don't prefer to watch or read such news in media, they would switch to other channels even if any channels show such programs. (Khyber Pakhtunkhwa: Interview 5, p. 2)

Their top priorities are other issues like security, poverty, unemployment and energy crises that affect them directly. Furthermore, there are so many immediate problems that those that may affect Pakistan in 25 or 30 years (like climate change) are not likely to move people.

According to respondents, they are experiencing disasters like floods, drought and abnormal conditions like extreme heat, resulting in water shortage and food insecurity issues; but some view these phenomena as natural and seek spiritual guidance. As one respondent articulates: 'people have more faith in religious institutions who declare climate change to be the punishment of God for the human sins' (Baluchistan: Interview 2, p. 1). As a result, they are not playing their role to initiate debate and pressure governments to take immediate measures against climate change.

However, local people are playing an effective role in initiating climate change debates at the local level. As one respondent states:

> At the country level, the community is not active in that way, but at the Gilgit-Baltistan level, the community is somehow vibrant towards promoting debates on such issues. Like in 1997 when there was a drought situation in the Diamer district and the local community initiated a movement for promoting the artificial glaciers stop fast melting of the existing glaciers. And the community generated a debate through meetings, seminars and at other forums. (Gilgit: Interview 3, p. 1)

In addition, some respondents feel that local people are important in the sense that they are the real witnesses of climate change and may be the first informers. It is because of them that issues of climate change are highlighted and debated within and across local boundaries (Punjab: Interview 1).

Another important actor are climate change experts (Anderson 2009; Hansen 2000; Allan 2004; Cox 2013), as indicated by the majority of the respondents. For respondents, an expert means a person who has knowledge of climate change science, conducts research on the local

environment and informs policymakers and the public about the causes and effects of climate change. For example:

> Yes, researchers and scientists, I would say these are equally important stakeholders in generating debate about climate change. The role of the researcher is exactly to show what is happening on the ground and definitely it affects the way the politicians think and the way the government behaves and the public reacts. (Sindh: Interview 5, p. 3)

The majority of the respondents indicate that Pakistan has a limited number of scientific actors (Beck 2009; Hansen 2000; Allan 2004; Lester 2010; Cox 2010; Schäfer 2012). Furthermore, they are not trained in the field of environmental sciences but are rather meteorologists, glaciologists, geologists and agriculturists working in either state institutions, semi-government organizations or the private sector. From the respondents' perspective, they are not up to date about the latest research in the field and refer to international research conducted in the Pakistani context to inform policymakers and the general public about climate change. They are affiliated with their parent departments and therefore do not willingly share information unless directed by civil bureaucracy and politicians. This gap is filled by scientific actors from other countries, who are engaged in local climate change research in different regional areas. In a sense, they are projecting the local impact of global climatic changes to the global world. As one respondent points out:

> You have some local research institutions that are based in Pakistan, and then there are some German NGOs and German institutions working in Pakistan. Then even there are some British institutions, even USAID—they have been doing some stuff on climate change and environment. (Punjab: Interview 1, p. 3)

Thus, some respondents consider industrial corporations and the coal fuel industry (Newell 2000; Boykoff 2011; Schäfer 2012) as an important lobby in the local politics of climate change. According to respondents, they are responsible for environmental pollution by expelling their industrial waste directly into the water and air. For example, a respondent argues:

> If you go to Lahore, Kasur and Sheikhupura district, the issue of water is very much present there. There are many leather factories which are polluting the water, even it is difficult to breathe there and water has become poisonous but unfortunately people are helpless. (Punjab: Interview 7, p. 4)

Besides damaging the environment, journalists stated that corporations are serving their capitalistic goals by hindering government and civil society organizations' efforts to implement climate change policies. For instance:

> They have huge stakes in terms of investment, whatever plans or decisions have been made, their interest are affected. So they make sure that their agenda includes their interest or protects their interest. (Sindh: Interview 5, p. 4)

A large number of respondents consider local media as important for disseminating climate change information and moulding public opinion towards local issues of climate change. As one respondent says:

> Media is also believed to be a second god. I would say for each of us, our individual lifestyle and the way we think is really affected by the media. Media definitely, I would say, frames the minds. And the media can change the way we think about a particular issue. If media is projecting any particular issue of climate change, this is really going to affect the way the people think about a particular issue and the way government responds and politician's respond. So the media has a very vital and central role in affecting the way politicians and the government behave. (Sindh: Interview 5, p. 3)

However, there seems to be an agreement that local media is not sufficiently projecting the issue of climate change at the local level. Rather, it has confined the subject of climate change to weather forecasts, covering related events (conferences, press briefings, etc.) and reporting on climate-induced disasters with no follow-up stories. Furthermore, in local news media outlets provide minimal information about global climatic change and its future challenges and effects. Notably, the media covers climate change issues only when they are reported in the foreign media. As an interviewee says, 'We cover it only when it is reported by BBC, CNN' (Baluchistan: Interview 2, p. 11). In contrast, some respondents

argue that English media is playing its role in informing the public about the future challenges of climate change but its audience is limited. As one respondent states:

> Let me give you an obvious example of it: famine struck Tharparkar and many children died- it was shortage of food, so 3 months before the *Dawn* newspaper published a report on it, and the reason it gave was that there the pattern of rain has to changed to a greater extent from about 5/7 years ago. But the people over there are traditional, so they were thinking that … in the rainy season it rains in this and this month, so they used to sow their fields in these months. And … they did not adapt to the changing environment, which is why they were struck with a famine. (Punjab: Interview 1, p. 9)

Overall, respondents attribute this minimal role to the educational background of journalists. There is no subject covering this topic on the curriculum at high school level. Even at the university level, there is no specialized reporting subject that can promote the knowledge and skills necessary to impart the significance of climate change to undergraduate media students. Apart from this, local journalists are not highly educated and come from arts and social science backgrounds (e.g. Punjab: Interview 3). Additionally, all the climate change science material (books and articles) is in English, while most journalists have an Urdu background. Consequently, they cannot read articles and books on climate change science nor listen to and watch documentaries and other live programmes on broadcast media. In the opinion of some respondents, the owners and editors, who are the decision-makers, have no knowledge of climate change because they also study in the same educational system. By this reasoning, editors do not encourage news reporters to write on climate change issues (e.g. Islamabad: Interview 2).

A majority of the respondents argue that the media operates on a business model and depends upon advertisements and subscriptions from the public and private sectors. As far as climate change coverage is concerned, there are no advertisements and subsidies from state and non-state actors. As a consequence, the media is not reporting on climate change issues and debates (Sindh: Interview 6).

Another contributing factor for some respondents is the low public demand for climate change stories. As far as climate change news reporting is concerned, there is little public demand. Consequently, there will

be little advertising and sponsorship originating from the business sector. As a cumulative effect of both material and public disinterest in climate change, no proper coverage of climate change issues is forthcoming (Khyber Pakhtunkhwa: Interviews 1, 4).

Respondents believe that Pakistani society is dealing with other problems—political instability, a poor economy, an energy crisis and internal and external security issues, followed by education, health and environmental issues. Hence, climate change becomes the lowest priority. The media is a reflection of society, giving coverage to the dominant concerns of society, with a few exceptions in climate change reporting like natural disasters. Even disaster-oriented reporting is not linked to climate change but is discussed in the political and economic context. More than half of the respondents being interviewed argued that the social environment is dominated by politics and terrorism and this is what is reflected in the news media coverage (Sindh: Interviews 6, 9).

Almost half of the respondents relate sparse coverage to the undue space given to the activities of political institutions. These respondents claim that Pakistani media is politicized and focuses more on political news and developments than other topics. Almost all news revolves around politicians, parliamentarians and ministers. A respondent from Gilgit reports 'media mostly follow political developments and never give time to issue base journalism. We see that statements of politicians are often given more space and time in our media' (Gilgit: Interview 7, p. 7). Even political reporting is considered prestigious in the circle of journalists; they enjoy fame and foreign tours and receive rewards like posts and foreign scholarships. No one is ready to cover environmental issues (e.g. Punjab: Interviews 4, 5, 7).

In contrast, a majority of the respondents argue that local media suffer from a 'breaking news syndrome' and report only on 'hot and juicy' news such as political rivalries, sectarian conflicts, crime, acts of violence, bomb blasts and disasters. Such stories provide the sensational material that creates hype and inculcates fear and terror among its audience. The sole purpose is to increase newspaper readership or channel viewership. As climate change stories have no such sensational element, there are few good reports on climate change in print and electronic media. A Sindhi respondent working for foreign media articulates: 'it does not have much sensation, it is not juicy and also because it is not the trend in Pakistan' (Sindh: Interview 9, p. 10).

The priorities of Pakistani media are not in line with the needs of climate change coverage. Instead, Pakistani journalists and reporters have a preference for sensational and dramatized news stories rather than serious issues attached to climate change. Such biased treatment may be the result of lower ratings, lack of funding and political inclinations that set the agenda for media coverage (Baluchistan: Interview 2; Khyber Pakhtunkhwa: Interview 4).

A small number of respondents argue that social activists are playing a more active role than NGOs and the government. They are initiating debates, launching public awareness campaigns and putting pressure on the government to form policy and on the industrial sector to introduce eco-friendly systems in their industrial units:

> There was an issue of making a tunnel through Islamabad's mountains, the Margalla Mountains. Mushahid Husain and his wife, they are very active. They took up the issue and somehow made a difference and their efforts stuck. (Islamabad: Interview 1, p. 4)

A few respondents even believe that schools, colleges and universities are aware of climate change and are bringing these issues to attention by arranging seminars, conferences and workshops (Sindh: Interview 2). Other respondents think that religious institutions fulfil a valuable service to the lower classes educating them about climate change: 'I think that our religious scholars, our mosques, our madrasahs are giving awareness to people, educate them that these are the issues of environment' (Khyber Pakhtunkhwa: Interview 1, p. 4).

In addition, respondents also perceive the presence of international bodies (Held 2010; Nasiritousi et al. 2014) at the local level, which liaise with local government and non-governmental organizations for the effective implementation of climate change adaptation and mitigation measures. They do so in order to attain the millennium development goals, i.e. sustainable growth to preserve and protect the environment. Furthermore, they are actively engaged in climate change communication to raise awareness among people. As one of the participant comments:

> In our areas various non-governmental organisations like the UNDP are very active in highlighting the issue and striving to raise awareness among people and governments. (Khyber Pakhtunkhwa: Interview 2, p. 3)

Some other respondents highlight the scientific role of international bodies in the regional areas:

> First of all, I think some international organisations and UN agencies, which are conducting research and studies over climate change and are compiling data and reports after a thorough study of the subject. (Gilgit: Interview 4, p. 3)

From the above results, it seems reasonable to argue that people, state, NGOs, experts, social activists, local media and local industry altogether construct the reality of climate change over the local arena. However, such reality is constructed in cooperation with global bodies, developed countries, international NGOs, transnational scientific research institutes and international media. In sum, the large-scale presence of global actors in the local arena and their trans-local activities earn them the status of cosmopolitan actors in the cosmopolitan sphere of climate change.

Perceiving Global Actors of Climate Change

Apart from the local actors, there are global-level actors that shape the cosmopolitan sphere of climate change. According to respondents, such actors operate at the global level and their activities cross geographical borders. The most important of all is the United Nations (Held 2010) and its sub-organs. Almost all of the respondents consider the UN as the primary actor in transnational debates on climate change. The respondents believe that the UN collects climate change data from different parts of the world, conducting research, compiling data, making reports and developing mechanisms, procedures and laws to implement it across the globe (Gilgit: Interview 4; Baluchistan: Interview 5). Respondents further argue that millennium development goals and clean development mechanisms (Red Plus and the Kyoto Protocol) are all the by-products of the UN's global efforts. A number of responses illustrate the main role of the UN in the global politics of climate change:

> I think that internationally all eyes are set on the UN, as all its organizations which work on the environment or those who set an agenda are the main stake holders. I think that the Secretary General of the UN has given statements on the environment and climate change many times. They had also set some millennium development goals, greenhouse gas emission

targets, clean development mechanisms and Red Plus so the UN is the main stakeholder. (Gilgit: Interview 3)

However, this is one side of the picture. A small number of respondents criticize the UN for its failure to achieve consensus among the developing and developed world over the issue of greenhouse gas emissions. They argue that it is being funded by big powers, so it protects their interests. They highlight how the USA and China are the major emitters of greenhouse gases but the UN is not forcing them to sign the Kyoto Protocol (Baluchistan: Interview 2). In other words, these organizations are subservient to Western powers. They do whatever they are told. Specifically, they cannot control the pollution of America and China but they make demands over the greenhouse gas emissions of developing countries (Sindh: Interviews 2, 8, 9).

Another important actor, quoted by almost every respondent, is the state (Biermann and Bauer 2004; Bulkeley and Newell 2015). Respondents discuss two types of states, namely (1) culprits of climate change and (2) victims of climate change. According to them, developed countries are responsible for global climatic changes and are now trying to reverse the process. To achieve this, they are collaborating with the UN and setting the global agenda of climate change:

> Look, at the global level, the governments of the developed countries [are involved]—all of them. They have their own interests—it is them who polluted the environment and destroyed the climate, and now they are the contractors of climate change. Now look those who are contractors, G8 countries- all of them, they have destroyed the climate and everything on this planet. When they have already destroyed everything- now they have come up as contractors. Now if you look at it from any angle, whether it is human rights, or any other rights … First they usurped and destroyed those too, they have done it and then again they come as contractors on their own. Now they say that they are in the field and sabotage those who will destroy climate change. (Islamabad: Interview 4, p. 3)

Respondents speculate that developed countries are the key players in the global climate change debate and are changing their roles from 'destroyer' to 'preventer'.

In contrast, over half of the respondents underline developing countries as an important stakeholder. They describe developing countries as

the victims of climate change and as having no or only a minimal role in contributing to global industrial emissions. Poor countries are not willing to compromise their growth at the cost of reducing greenhouse gases, and their contribution to global emissions is already low; therefore, they are not willing to reduce carbon emissions, a sentiment exemplified in the following quote:

> Actual stakeholders at the moment are developing countries; I think they are not very enthusiastic about it. They take this position that when the West and US were developing, they did not bother about the environment and pollution and gas emissions, and now when it is supposed to be the Asian century, with both China and India on the go… I mean, China is not paying any heed to this problem. India again, I don't think. These are two major countries, which should not ignore it because their future is linked to the ratio of climate change, but they are not bothering. (Islamabad: Interview 5, p. 2)

According to some respondents, developing countries have formed a block (the D77) and are pressuring the G8 group to devise better policies and mechanisms to curb their emissions and give support to the least developed countries (Punjab: Interviews 3, 4, 6).

Another actor is the global civil society (Kaldor 2003a, b). The most active and resourceful among them are international non-governmental organizations like the WWF, Oxfam, Greenpeace and IUCN. Media professionals consider them to be secondary actors because they depend upon state actors and international bodies for funding and the implementation of their projects. Furthermore, they launch advocacy campaigns to increase public awareness in developing countries and collaborate with local governments for adaptation and mitigation measures:

> Civil society, yes, definitely at these negotiations you have WWF, you have IUCN, you have Action Aid, you have Greenpeace which are the big NGOs with a big voice at the international level; at the national level it's the LEAD, UNDP, IUCN and WWF mostly. They are the ones who are leading the way in climate change. (Punjab: Interview 6, p. 3)

In addition, a large number of respondents refer to independent scientific and academic institutions (Neil and Boykoff 2011; Schäfer 2012), and think tanks (McCright and Dunlap 2000; Schäfer 2012) because of

their expertise in climate science. In other words, they conduct scientific research on the phenomenon of climate change in different regions of the world, explaining causes, visible impacts and future risks. For instance:

> It is different at the international level, at the international level I think that the contribution of academia… research centres and institutes is the most significant … it is mostly focusing on climate change and they are allocating more funds for it too, more opportunities are given to the local people for conducting research related to environment changes. (Punjab: Interview 7, p. 4)

Other types of non-state actors include multinational corporations (Newell 2000; Monbiot 2006) and the war, chemical and coal fuel industries. According to respondents, these hamper every global effort to reduce carbon emissions. Media respondents named BP, Shell, ExxonMobil and the genetically modified (GMO) food industry among them:

> There are big organizations like BP, Shell, ExxonMobil, the genetically modified food industry… the mighty industrialists that caused global warming … they are sabotaging the world's efforts to solve climate change issues, so they are stakeholders too. They are investing in scientists and media for the propagation of the anti-climate change movement. (Baluchistan: Interview 5, p. 2)

On the other hand, there is the green industry, which is using methods, materials and techniques (green technology) to meet global energy needs without damaging the environment:

> I think the green lobby has its materialistic interests in selling clean fuel technology to developing countries because they want to create demand in these countries for their projects. So, they are playing an active role in all the international treaties and agreements like Copenhagen etc. (Baluchistan: Interview 5, p. 2)

For some respondents, the solar energy sector is the 'champion' industry of climate change. They invest billions of dollars in research, climate change conferences and summits, and propaganda campaigns who decry the deleterious effects of coal. As one respondent says, 'They are

persuading people to save the planet by shifting to solar energy panels for their home and electrical appliances' (Sindh: Interview 6, p. 3).

A small number of respondents believe that transnational media (CNN, BBC and Al-Jazeera) are important actors of global cultural politics. They are the main communicators of climate change issues, conflicts, political and scientific developments within a globalized scope (Berglez 2008). Although respondents agree that transnational media are giving adequate coverage to climate change issues, like for local media most of their coverage is event-oriented (including international conferences and summits on climate change, World Environment Day and disasters like tsunamis, floods, famine and earthquakes). For instance, a media expert notes: 'I noticed that international news channels like BBC and CNN focus on natural disasters, summits and conferences most often' (Islamabad: Interview 6, p. 4).

There are also a number of respondents who maintain that scientific news stories currently constitute the majority of the international news coverage of climate change issues. The sources of these stories are climate change institutes and experts who disseminate their findings, models and publications through the platform of global media. As one reporter commented:

> It is coming from the international news media. Basically when international research is done, it is published and then it comes forward over the transnational broadcast media—that these are the changes coming, or if some book is published by the UN then we see it due to the attention in both international print and electronic media. If they launch some project through NGOs than this information comes across the global news networks and online news websites. (Punjab: Interview 4, p. 7)

A majority of the respondents agree that the ozone layer and global warming are the most debated issues in global news media. They argue that international media construct global warming and the ozone layer in the problem-oriented frames. For instance, CNN and BBC have produced a lot of different programmes, documentaries, articles and columns on global warming and the ozone layer over the years. As one respondent states:

> On the international level it is the same that is the different reasons why climate change is happening, and after it that the global temperature is

increasing, their biggest concern are different gases because of which mixing into the air due to various reasons and the global temperature increasing. There is a big debate on it in newspapers and in the media of various countries. Very hot debates have been held on it. And they happen every year, how to stop this rising temperature. (Sindh: Interview 5, p. 3)

Over half of the respondents feel that the most debated issue in transnational media are climate change-oriented conflicts, such as those between climate change activists and sceptics or between developing and developed countries over reducing greenhouse gases.

Some journalists argue that global media emphasizes global problems and highlight the international political efforts and scientific solutions to address climate change. For instance:

I feel that foreign media do investigative stories and hard news stories on the climate change policymaking of international bodies and superpowers, and the adaptive and mitigation measures are adopted by advanced and developing countries respectively. They have access to scientists, policymakers, decision-makers—all that makes solution-based stories. (Punjab: Interview 7, p. 9)

Only one respondent mentions climate change deniers who challenge climate science; they include scientists, the coal fuel lobby and media personalities. For this respondent, they are sowing the seeds of doubt and uncertainty. They use different scientific models that maintain climate change as a natural phenomenon and not a future threat.

Interviews reveal that the UN, nation states, NGOs, transnational corporations, the scientific community, climate change deniers and global media are considered as the prime actors of the global arena and are responsible for constructing the global reality of climate change. However, such reality is constructed in conjunction with local governments, local civil societies, local scientists' local communities and local media. In brief, the very existence of local actors in the global arena and their transnational activities qualifies them as cosmopolitan actors in the cosmopolitan sphere of climate change.

Perceiving Cosmopolitan Actors
in the Cosmopolitan Sphere of Climate Change

In the light of the discussion above, it could be argued that perceived climate change actors can be divided into 'human' and 'technical' actors on the basis of their human attributes and technical traits.

They may also be divided into local actors and global actors depending on the scope of their climate change activities across borders. Furthermore, local actors are also present in global arenas, while global actors exist in local arenas. They work independently in their respective arenas, but at the same time they are interconnected through physical mobility (Urry 2007) and digital networks (Castells 2009). One example is the fieldwork conducted by local scientific institutions in collaboration with international research centres (Lahore: Interview 7). Another good example is the alliance of local non-government organizations with international bodies like the UN and international NGOs over digital networks to launch climate change projects and awareness campaigns (Islamabad: Interview 4) city editor, English newspapers).

Thus, it can be inferred that climate change actors are cosmopolitan in nature because of their local, global and digital existence, their broad range of activities that negate the concept of time and space, and the interconnectivity of their activities across arenas. In brief, cosmopolitan actors of climate change construct the cosmopolitan reality of climate change in 'gloco-digital' arenas. It is worth mentioning that climate change actors cannot perform their role effectively unless interconnected through a communicative space. In other words, without any physical and digital interconnectivity between climate change actors, the very idea of climate change as a cosmopolitan sphere is invalid. All these examples emphasize the need to assess the role of communicative space in the construction of the cosmopolitan sphere of climate change, which we will discuss in the following section.

PERCEIVING THE COMMUNICATIVE SPACE
OF CLIMATE CHANGE COMMUNICATION

In addition to the epistemic arenas and the cosmopolitan actors that construct the cosmopolitan reality of climate change, respondents of the study also perceive communicative space. From the respondents' perspective, a communicative space is created when climate change actors

adopt physical or digital means (or both) to gain access to climate change information or its dissemination. This suggests the existence of physical places and digital spaces of climate change communication.

The majority of the respondents argue that climate change information is communicated through offices of state institutions, private sector NGOs and regional offices of international bodies. As one respondent states: 'I go by myself to the Climate Change Ministry, and organizations like SDPI, Oxfam and go directly to the regional office of the UN' (Punjab: Interview 10, p. 6).

In addition, educational institutions are seen as the real places of climate change communication. All the scientific information is communicated through this process. As one participant says:

> I personally visit university professors in order to get scientific data supporting my story. Sometimes they communicate their research findings through their conference papers in the conference halls of universities. (Sindh: Interview 9, p. 8)

However, international conference and summits arranged by the UN and its allied agencies, and seminars, workshops, short programmes and press briefings by state and non-state actors are the privileged spaces for climate change communication. For instance:

> Our state officials pay visit to foreign countries, share information with them and sign agreements of mutual cooperation. Our representatives speak on the UN platform about the challenges of climate challenges in Pakistan… Our official representatives take part in the UFCCC forum and inform other countries about current threats of climate change to Pakistan. Our NGOs, too, are projecting the image of Pakistan as the most affected country by global climatic effects. (Sindh: Interview 6, p. 8)

A small number of respondents think that affected areas are the places of climate change communication. As one respondent states:

> When we used to go to local affected areas for reporting, we meet experts (local or international) government officials, NGO staff and social activists. Then we got a chance to talk to them and they discuss different aspects of climate change. (Punjab: Interview 8, p. 6)

Local media is an important place for the dissemination of climate change information. All climate change-related local and global events, issues and debates are communicated through this platform:

> Whenever I need to write something on climate change I visit my colleagues in media houses, chat with them, discuss with them and get to know a lot of articulate or tacit information of climate change. (Sindh: Interview 4, p. 5)

The above findings show that physical places are important means to communicate climate change information. However, with the advancement of communication technology, physical places are not the only way. Rather, the use of digital technology is a common way to exchange information across borders.

Respondents also perceive a digital space of communication (Castells 2010; Urry 2007), which negates the boundaries of space and time. Almost all journalists interviewed believe that climate change actors produce, communicate, exchange, distribute, consume and receive climate change information through digital networks. In other words, all climate change-related information—data, knowledge, scientific measure—is accessed and shared through digital spaces in the cosmopolitan sphere of climate change. As one respondent says:

> We are present on digital networks… our state departments and NGOs have official websites, our civil society activists are on social networking sites like Twitter…they have webpages, they have formed climate change networks…. We have online media, we are digitally communicating our problems, issues and debates about climate change. (Azad Kashmir: Interview 5, p. 8)

Another example of the use of digital space is expressed in the following quote:

> I access information digitally by watching documentaries on YouTube, listening to the news of climate change summits such as Copenhagen on radio and TV, studying eBooks and e journals, web searching, using digital libraries, interviewing relevant personnel via Skype, email, audio and video conferencing, cellular networks and mobile applications, etc. (Punjab: Interview 9, p. 23)

The above responses suggest that actors communicate climate change information in a parallel way over digital space, which is not subject to geographical boundaries.

Findings above indicate that all forms of climate change communication take place through both physical places and digital spaces. Therefore, it can be argued that physical places and digital spaces together form the 'communicative space of communication', or, we argue, the physico-digital space of communicative flows. Such communicative space is the expression of cosmopolitan climate change actors and facilitates the smooth flow of climate change-related data, capital and technology between the loco-digital and globo-digital arenas of the cosmopolitan sphere of climate change communication.

Construction of the Cosmopolitan Scale of Climate Change Communicative Flows

It seems that local journalists perceive climate change issues in contexts of epistemic 'arenas', 'actors' and 'communicative space' as terrains for the reflexive construction of the 'cosmopolitan reality' of climate change.

The cosmopolitan reality of climate change is constructed within the 'loco-digital arena' even in a developing country, such as Pakistan where digital access is mainly possible in cities. The 'logic' of journalistic practice dealing with climate change (and other globalized risk issues) consists of several components.

Due to the complex relational practices by local journalists, climate change is communicated as an 'issue' through the interaction across different 'layers' or—what we call—epistemic arenas.

These range from physico-digital spheres, reconstructed as a global problem, contested and addressed in the axis of a 'globo-digital' arena. Climate change is then recommunicated to the 'loco-digital' arena in the form of techno-scientific solutions and policy measures. In this loco-digital arena, policy measures and scientific solutions are restructured and debated in a localized context. Solutions are finally implemented in the form of adaptation and mitigation measures to counter the challenges of the globalized risk of climate change. In summary, gloco-digital arenas, cosmopolitan actors and the physico-digital space of communication construct the cosmopolitan sphere of climate change communicative flows. This model is exemplified in Fig. 6.1.
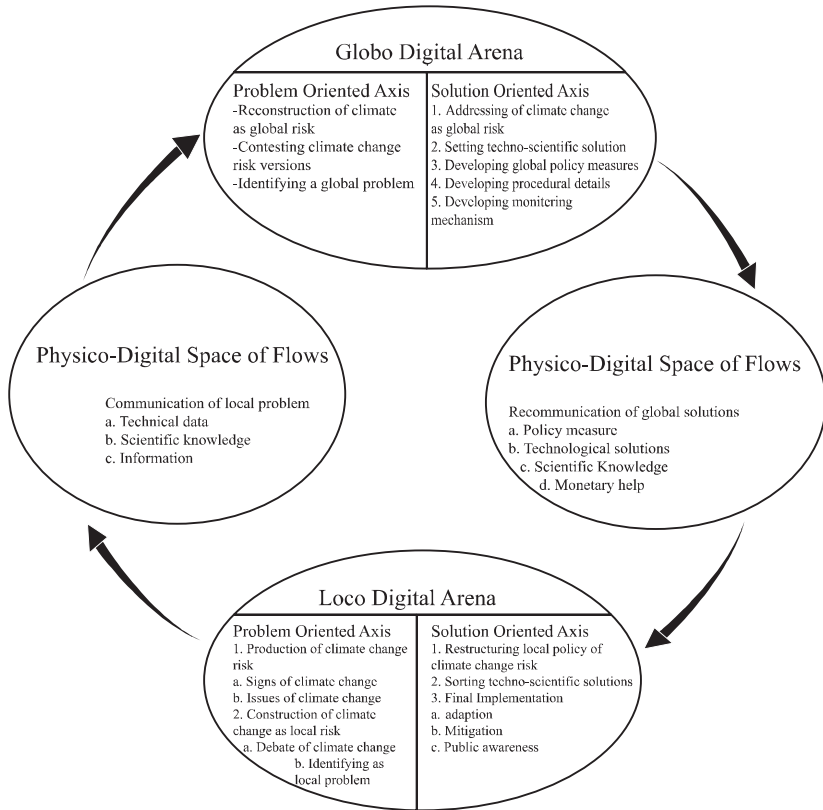
Fig. 6.1   Cosmopolitan scales

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The Construction of Cosmopolitanized News of Climate Change at the Micro-scale: Representation, Production and Communication

The previous chapter constructed the 'macro-scale' of cosmopolitan spheres of climate change communication across three parameter: arenas, actors and communicative spaces.

In this chapter, we take this discussion further by examining the 'micro-scale'. The term 'micro-scale' focuses specifically on the 'logic' of producing local news in the 'loco-digital' arena. In contrast to traditional approaches that distinguish between 'digital' and 'non-digital', this approach incorporates the reflexivity of digital engagement and local perceptions and identifies the loco-digital arena as a localized, yet transnationally connected discursive sphere.

Unfolding the loco-digital arena, the chapter specifically focuses on the way journalists perceive (1) the cosmopolitan character of local climate change news stories, (2) the cosmopolitan phases of local climate change news construction and (3) the cosmopolitan nature of local climate change news communication.

COSMOPOLITAN CHARACTER OF LOCAL CLIMATE CHANGE NEWS STORIES

The question 'What are the main issues of climate change news stories' elicited a range of responses. According to a large number of respondents, the most reported news stories on the topic of climate change

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are event-oriented (Boykoff 2007a, b; Cottle 2009; Cox 2013), as it is also apparent from the following quote:

> If I talk in relation to Pakistan… The news that you will find will be event-based. For example, specifically, when it rains in the monsoon season, and the flood that comes due to this rain … this is an event. Then there is the event of drought, for example. (Baluchistan: Interview 1, p. 4)

From the respondents' perspectives, stories of this type just report the sequence of events and lack any investigative depth, as shown in the following comment:

> We are reporting an event; we are not looking at its reasons—what are the reasons? Why is it happening? What are the reasons behind this change? We are not telling this, if change has taken place we are not telling why it has happened. (Punjab: Interview 8, p. 4)

The majority of the respondents pinpoint the increasing trend of 'breaking news syndrome' in the local news outlets and argue that such a trend leads to 'spot' news coverage in climate change news reporting. The major agents behind this are the Climate Change Ministry, local and international non-governmental organizations, United Nations agencies and environmental activists, who market themselves by informing the media about their work on climate change-related issues and developments. The platforms for such marketing are seminars, workshops, conferences and press briefings, which make up most of the local climate change news in the Pakistani media. For instance:

> There is mostly a kind of spot news coverage of events that might include conferences, seminars, workshops, book launches, or report launches that have to do with different organizations, research institutions, or individuals working in the field of climate change. So NGOs working on climate related projects might hold a seminar and invite experts to speak … Newspapers might cover that, so that's an example of spot news as well. (Punjab: Interview 9, p. 4)

A common view among respondents is that the most frequent type of climate change news stories are disaster-related ones (Cottle 2013; Cox 2015). Such stories, they argue, are the result of unusual natural disasters like earthquakes, floods and droughts. As Pakistan is facing these

disasters on a continuous basis due to environmental changes, they have become the focus of attention for news media. The frequency of such news stories is related to the impact, magnitude and timing of the disasters. For example, a respondent from Sindh reports:

> As I told you about the recent drought in Tharparkar and its impacts, many stories were published about it—a huge number not only in local media, but also in international media. For 2-4 years, continuous floods have been occurring, and rain too. As we saw, a flood occurred in lower Sindh, then before that it occurred in 2012 in the northern area, and before that, it was the flood of 2010—so we've had them in the entire country. So because of [climate change] we've had floods and droughts, and many stories were published about them. (Sindh: Interview 2, p. 4)

Just over half of the respondents claim that the weather report is the routine news of various local media organizations and is broadcasted on a daily basis. News of this kind, according to respondents, is based on facts and figures from the Meteorological Department of Pakistan, which predicts local temperatures, rainfall and weather patterns. Some of the respondents state that the duration of the weather report is too short to provide enough details to people, and most specifically to the farmers. Furthermore, most of the time, weather news is not correct or up to date. Consequently, people take Google, world meteorological organizations and international media outlets such as CNN and the BBC as more credible sources for weather forecasts. For instance, a broadcast media respondent concludes:

> I myself have been doing the bulletin, which was just a 15-second weather report. Now you tell me, in 15 seconds, what can you tell people? What you can say to your viewers—you cannot tell them anything. You cannot go over 15 seconds. And if something big happens in 1 minute or 1.5 minutes (currently there is an example of a cyclone), for about 1.5 or 2 minutes, the news is broadcasted. (Baluchistan: Interview 2, p. 6)

The most common topic of their stories are the local issues of climate change. There is a slight variation between stories from different local regions. For example, drought is the local issue of the Sindh and Baluchistan regions, floods are the issues of local areas of Punjab, Sindh and Khyber Pakhtunkhwa, whereas for Gilgit, it is glacier melting, and for Azad Kashmir, Khyber Pakhtunkhwa and Gilgit, the main issue

is large-scale logging on the mountain regions. Talking about this, an interviewee says:

> I work on the issues that I see around us, like the melting of glaciers, deforestation, and landslides. These [phenomena] are interlinked and we often publish stories on them because such disasters often affect the poor segments of society. Our area is very small and such issues largely affect the local communities. They could be the subjects of climate change news stories, and [thus] I often concentrate on them. (Gilgit: Interview 7, p. 4)

Climate-related political news stories are another common category of local news media. Stories of this type politicize local issues of climate change by giving coverage to political statements of prime ministers, ministers and opposition leaders on climate change issues, reporting debates on climate change policymaking in the legislature, monitoring the performance of the Climate Change Ministry and arranging talk shows by inviting politicians, state representatives, experts, analysts and environmental activists to debate on national policies on climate change and their implementation. A significant example of such news reporting is the linking of local climatic changes, such as the rise of temperature, and the pollution caused by the metro bus project launched by the government of Pakistan. As one respondent sums up the political nature of climate change news stories:

> One line of climate change reporting in Pakistan is very conventional by Pakistani standards, because Pakistani news is dominated by political content, news content and political controversy climate change stories also deal adamantly with whatever the government is doing—any measures to come up with policies and actionable steps to protect Pakistan's people against climate change threats, within the country's own defence mechanisms against the threat of extreme weather. This kind of reporting also focuses on government inefficiency, lack of or gaps in implementation of policy, and also bureaucratic inefficiencies. Sometimes they are due to financial mismanagement and sometimes they are simply due to the government's apathy to climate change… so that's sort of one area of climate change reporting. (Punjab: Interview 9, p. 7)

A quarter of respondents claim that an equal portion of news stories focuses on the suffering of local people, who assume the utmost importance as they are directly affected by environmental changes. One

example is the people-oriented news stories of Sindhi media during the famine of Thar. As Abbas Sahi describes,

> I always write stories from the people's perspective. You know, for me it's always the people's perspective that is most important. It's the people's perspective that gives news stories a local flavour. You know, if something is really hurting people, then it's a story. I always make it kind of people-oriented—if they say that yes, this phenomenon is hurting them, then I would say it is a phenomenon; if they are happy and say it's not hurting them, then for me it's not a story. (Punjab: Interview 1, p. 4)

A few respondents even argue that local media also give coverage to international news about climate change, which includes natural disasters such as the coverage of the tsunami in the Indian Ocean and Hurricane Katrina in the USA, the drought in Africa, as well as international seminars, conferences and summits organized by global bodies like the UN, and scientific reports by transnational institutions and research centres. However, they are limited in number compared to other international news events. For some respondents, international issues and debates are covered only if Pakistan is participating in the debate directly or indirectly. The following quote elaborates on the international nature of climate change news at the local level:

> In my opinion, wherever in the world the discussion on climate change is taking place, the media is covering it. … When the Copenhagen Conference related to climate change was held, the entire local media devoted a lot of coverage to it. (Interview 6, p. 4)

A common practice of local journalists is linking local climatic changes like the rising of temperatures, the stretching of seasons and climate-induced disasters like floods and droughts with the cross-border activities of state, non-state and multinational corporations. For example, a Sindhi respondent states:

> We are saying that India is building dams, we have limited this issue to the level of dams only, we are not focusing on why the glaciers are melting …India is holding water, building dams on different rivers, violating the Indus Basin Treaty… they open the doors of dams and do not inform us about the floods… They are polluting water with industrial and nuclear

waste without any filtration… they are sending waste through water, the Ravi river is dry…. (Islamabad: Interview 2, p. 7)

A few respondents hold the USA responsible for the global war on terror in Afghanistan, which is bringing ecological changes in the local environment and affecting communities. For instance, one electronic media participant speaks:

USA's military operations in Afghanistan and its bombing raised the intensity of the heat in Pakistan and dried the water flowing from Afghanistan to Pakistan. (Khyber-Pakhtunkhwa: Interview 6, p. 5)

This indicates that local journalists are also contributing stories that are global in nature by merging together the local and global elements in the same story.

Another interesting finding of the study, as claimed by respondents, is that Pakistani media is sensationalistic, and this is reflected even in climate change news stories. They agree that climate change news stories get coverage only if they fulfil the very criteria of sensationalism:

Our psyche has become [full] of bombs and blasts, which is why whichever story we make, unless we discuss a disaster … our story will not be covered. This is the reason that we add such things in our story construction—you know, something that we call the sensational element. It is a duty; in its face, we are helpless. (Punjab: Interview 8, p. 4)

These insights reveal the ways in which climate change stories are produced at the local level, although this percentage of local stories is low in contrast to political, economic and national security news stories.

Most of the local climate change news coverage is based on event-oriented news, followed by spot news and disaster-oriented ones, and is political. In comparison, the ratio of local, international, scientific and people-oriented climate change stories is limited, and they are not getting enough time and space on different news media outlets. In brief, news media seem to produce climate change stories at the local level, though their contribution is not significant compared to political and conflict-oriented news. In terms of content of climate change stories, it can be argued that local news and global news are similar. These findings

also reflect debates in journalism (Boykoff 2007a, b, 2011; Hansen 2010; Lester 2010; Cottle 2013; Cox 2015). Unlike global news, local ones do not give adequate coverage to climate change issues compared to other issues such as politics, economy and inter- and intra-governmental conflicts. The findings above also support the traditional approach that argues that the standardized form of news is produced across different news media outlets operating in different regions (Cottle 2013).

To sum up, it can be argued that climate change news is cosmopolitan in character because of the similarity in patterns of news reporting and themes, and also the underlying interconnectivity between local and global (i.e. the nexus between cause–impacts and problem–solutions).

Perceiving Phases of Local Climate Change News Production

Having discussed the cosmopolitan nature of climate change news, informed by Cottle's (2013, p. 19) argument that the first wave of ethnographic studies, which were conducted in national, Western contexts and mainly in mainstream national news outlets, has failed to conceptualize, both theoretically and empirically, the complex changing mediascape of news production (i.e. the convergence of local and global media platforms, the synergy of old and new media) brought about by information and communication technologies, we move ahead to address the question of how local news media outlets produce climate change news stories. To this end, the respondents come up with a threefold process of local climate change news production, namely (1) 'pre-construction', (2) 'construction' and (3) 'post-construction'.

Preconstruction Phase of Local Climate Change News Story

In the preconstruction phase, journalists generate ideas for developing and writing news stories on climate change. Bantz et al. (1980) called this process 'story ideation'. This phase emphasizes the importance of journalistic relationships with global and local, human and technical and physical and digital actors that help journalists construct the very idea of the climate change story. To this end, media respondents come up with different ways of gathering ideas.

Idea Generation in a Climate Change News Story

The question 'How do you come up with climate change story ideas' yields a range of responses that inform the idea-generation process of climate change news stories.

According to respondents, the most common way is to get ideas from the local surroundings, where a journalist resides and which can influence his or her writing; as one radio reporter explains, 'I get ideas from the surroundings'. In this case, any unusual change in the surroundings gives the journalist an idea to write a climate change story. As one respondent expresses:

> In my area we experience floods, so for me the question is: why did we have a flood, and why are they coming over and over again? There were not many floods before. Here, we had a flood in 2007, then in Makran, and now recently a so-called island has emerged in Gwadar. So, all these things serve as a stimulus and when one thinks about it, they lead us to the topic of climate change. For example, in 2010 our districts, Naseerabad and Jafarabad, were struck by floods. This event gave me the stimulus to write a new story. (Baluchistan: Interview 6, p. 5)

This response suggests that it is the surrounding environment that guides journalists in the selection of their topics for climate change news reporting.

A number of respondents believe that the formal and informal relationships of journalists with individuals like colleagues, friends, politicians, scientists, industrial workers, official clerks and civil activists frame their news stories. Such encounters take place in the form of meetings, gossip and discussion over physical places and digital spaces, which can produce the idea for a climate story:

> The individuals at the IUCN, WWF, Climate Change Ministry, media houses, Meteorological Departments, agricultural council, district government, and in NGOs like this discuss their routine activities with us. This is how I learn from them, infer ideas and then make my own report. (Islamabad: Interview 2, p. 3)

A large number of respondents express their opinion that meeting with affected people, involving face-to-face interaction and recording of their

emotions, feelings, problems and issues, can provide ideas for a news story. As one interviewee puts it:

> I went to the Land Owners Committee Action and met the chairman there. Unexpectedly he gave me so much information. In one lecture he provided me with a lot of knowledge and information. Similarly, I went to a ground farmer, so the situation he told me broadened my vision and I got a lot of ideas. (Baluchistan: Interview 4, p. 4)

The above quotes indicate that local communities give direction to the journalists to construct climate change news stories.

The majority of the respondents believe that media organizations give clear-cut topic outlines to the journalists to develop a news story. In other words, assignments are given to the news reporter, helping him or her to frame climate change news stories:

> For example, sometimes a bureau-in-chief may give me an idea, clue or assignment for a news story on environmental issues. (Punjab: Interview 1, p. 5)

Similarly, another respondent says:

> As we have a regular news beat in the Express Tribute on climate change issues, so we are bound to report on climate issues. (Punjab: Interview 9, p. 7)

In all cases, the respondents report that the most common practice in news media houses is to create climate change news stories on the basis of events and issues that have larger social and economic impacts. For instance, the large number of deaths in Thar gave journalists the incentive to report on the drought there in the context of climate change:

> Frankly speaking, whenever there is any incident like flash floods or rains or deforestation, which often play havoc with the lives and properties of people, damage infrastructure, and disrupt communication systems, these are the occasions which suddenly make our minds click for a story on climate-related issues. This is what we have been writing stories about during the last couple of years about climate change. (Gilgit: Interview 7, p. 4)

A common view among respondents is that it is the institutions at local as well as global level (political, economic, legal, educational, scientific, social and cultural institutions) that inspire journalists to write stories on climate change. An exemplary statement from a respondent illustrates journalists' reliance on global and local institutions for forming ideas:

> …Sometimes I get to interact with the local scientists and policy makers and planners of the government, other times I contact judiciary, economic and scientific institutes and they all definitely share a lot of information, which becomes a source of story ideas for me…. When we have discussions, informal meetings and chit chat with people of different local, national, regional and international institutions …the ideas come from there too… they write their reports on these issues and give us press releases and press briefings, which I find on their websites such as UNFCCC and IPCC, Climate Action Network, and the data portal of the World Bank and BBC Climate Asia. (Punjab: Interview, p. 5)

Almost half of the respondents consider the Internet to be a global database of climate change information that helps journalists to formulate ideas for writing climate change stories by providing them with access to policy papers, research papers and e-books. Respondents provided ample evidence that local journalists most often browse Web pages to acquire the information needed to develop local stories about climate change:

> You see, as I have talked about ideas, they come when you are reading climate change literature from the entire world, available in physical places and the internet. Scientific articles, policy papers, books, visual data, data portals news features, and blogs help you to get some ideas for your news story writing. (Punjab: Interview 2, p. 5)

A small number of respondents claim that national and global news media outlets are alternative platforms for journalists to conceive ideas for their local stories. They agree that in many cases, journalists write follow-up stories on the basis of published or broadcasted news over national and transnational news media outlets:

> I develop the idea of a story while watching international documentaries on National Geographic, the BBC, and reading articles, columns, features

and news on *The Guardian, New York Times*, and *The Washington Post*, and listening to Deutsche Radio programmes on climate change. (Punjab: Interview 5, p. 5)

For a few respondents, social media is the main source of climate change ideas because journalists get most of the ideas from Facebook, Twitter and YouTube.

Another notable finding of the study is that ideas from one source generate more than one idea suitable for a news story on climate change. As one interviewee states:

When we talk to the experts then we come to know that we should work from this side too, because we take a single line that we have to work on. But when we talk and have a chat with an expert then he tells us five more things, and these ... should be covered too. (Punjab: Interview 7, p. 4)

In addition, almost all respondents believe that reflective thinking on the part of journalists is the ultimate factor in deciding a climate change news story. Furthermore, respondents argue that it involves the twofold process of observing and thinking, which leads to the formation of a story idea in the mind of the journalist. As one respondent reports:

Ideas come when an individual start to observe or think about the things in their surroundings, meets with individuals, with the public, watches television, listens to the radio, reads newspapers, surfs the internet — then something comes into the human mind that questions why it is so. When journalists think about the why and the how, then many paths open up to him. (Punjab: Interview 3, p. 5)

The above discussion demonstrates that different forms of journalistic relational interconnections with different local and global, human and technical, physical and digital sources end with a subjective decision about the final idea for a story. This completes the preconstruction phase of news production, i.e. the precipitation of a news idea that determines the nature of a particular climate change news story. However, engendering ideas is not the end of journalistic relational practices. Each idea prompts a further chain of relations for the development of the story (the construction phase), which is the topic of the next section.

Construction Phase of Local Climate Change News Story

The second phase of producing climate change news stories is the development of the story idea with the relevant information obtained during interaction with actoral sources of information. For this purpose, local journalists once again engage with human, technical and digital actors. The development stage starts with the (1) selection of sources (human, technical and digital), followed by (2) gaining access to them, and ends with (3) obtaining relevant data and information for reporting on climate change.

Selection of Actoral Sources for Climate Change News Construction

First, we address the selection stage during which journalists seek to find the most relevant actoral sources for their climate change news story. Overall, respondents report that the very nature of the story predetermines the choice of sources. For instance, the following interviewees explain the selection process of the informants:

> First of all, I have to think what kind of story I am going to publish and I will try to find out sources accordingly. For example, if there is heavy flood in Chatorkhand or any other village I will go to the people to ask about its affects and damages, which affect the local community. If I write a story on the melting of glaciers, which affect the flow of water, I have to also go to the people in the area, who also know much about glaciers, and who have resided there for years. Then I go to the relevant government departments, national and international agencies, and then to national and international non-government organisations which work on the specific subject. Then I seek the views of the experts on the specific subject on which I am going to write a story. (Gilgit: Interview 4, p. 4)

> Suppose there is a story about agriculture and the impact of climate change on agriculture. I have to talk to weather scientists, I have to talk to water scientists, I have to talk to glacier scientists, I have to talk to the farmers who are the key source of information … and definitely these are all sources from which you get information. When you build up a story based on these opinions then a story becomes really unbiased and balanced. (Sindh: Interview 5, p. 7)

In the above responses, two different types of stories are identified: disaster-oriented stories where the people and local community are the source of information, and scientific stories where environmental scientists, government and national and international agencies are the sources. Thus, the criteria for the selection of sources and their numbers are pre-ordained by the type of news story. Furthermore, the most common practice is the use of all four to five sources, such as officials, international bodies, NGOs, experts and lay people; in other words, these are present in almost every climate change news story.

The majority of the respondents feel that government departments in Pakistan, such as the Climate Change Ministry, the Meteorological Department, the environment protection agency, the Disaster Management Authority and the Agriculture Council including their staff (bureaucrats, technocrats and clerks), are the 'real' sources of information for the development of the story. According to these respondents, state sources are present in every news story because of their large-scale engagement in climate change activities such as developing policies and implementing measures to handle local climate change issues. Furthermore, they are considered a credible source of information because of their unlimited human and financial resources. In other words, a local news story is not complete without a reference to the state sources. For example, a print media respondent notes:

> We have a climate change ministry that provides all information about national climate change policy, climate change-related projects and the government international stance and global cooperation in the field of climate change efforts. (Sindh: Interview 6, p. 5)

Some of respondents express the belief that owing to the Secrecy of Information Act, state officials are not willing to share information, as it will expose their department or ministry's mistakes. In this scenario, journalists get relevant information informally from the other people working in the same departments, keeping their names anonymous. Such revealed information brings into light the loopholes of climate change projects:

> But there are government people who do not want to be quoted by their name or by their office name. So they want to be quoted as anonymous. …
> I would say that the information that really makes news for me or for my

newspaper organisations also comes from sources who want to be anonymous because they fear any political or non-political reaction from their own organisation or ministry. (Baluchistan: Interview 2, p. 8)

Public relation officers of state institutions are approached, who are responsible for all climate change communication with the public and media. It is the duty of public relation officers to arrange press briefings for journalists and issue press releases on a regular basis in order to inform the donors and the public about their policies, current projects and the milestones achieved during the year. Other times, it is the relationship with lower-level staff, like a clerk, that helps journalists gain access to required documents:

A trade secret of journalism is that you have to remain in contact with every person; but those who society call 'small people', where I am from they are 'big people', and you have to keep on good terms with them, you have to have more discussions with them, focus more on them, and you do not have to consider them as subjects. They are respectful humans and they have more information—the individuals of lower grade. (Punjab: Interview 7, p. 7)

Secondary to state sources are international bodies working in the domain of climate change, as perceived by the more than half of the respondents. Respondents consider data banks for local journalists. They identify the operation of the UN, UNDP, UNFCCC and UN Habitat at the local scale. Most of the respondents state that these organizations have an international reputation and their specialized work earns them a place in climate change stories. As a result, every type of news story has quotes from the people working in these bodies. A few respondents even claim that they are more quoted than governmental sources in solution-oriented stories, like implementing mitigation and adaptation measures of climate change:

Just like UNICEF has done research, WHO has done it, or some government organisation…IUCN has done research on [climate change]. As their title and name comes with reports on climate change, so many of us search their names on the internet and then get information and knowledge from the webpages of these organizations, or directly contact them. (Khyber-Pakhtunkhwa: Interview 3, p. 4)

Alongside these, more than half of the respondents identify non-governmental organizations in both their local and global capacity depending on their scope of operations, like Oxfam, the International Union for the Conservation of Nature (IUCN), the Leadership for Environment and Development (LEAD) and WWF, who work on different climate change projects independently or in collaboration with government and international bodies. Here, journalists obtain details on climate change research advocacy groups and are privy to projects from these organizations' media relations departments. Sometimes they arrange press conferences, international conferences and workshops, and press briefings where the details of ongoing projects are shared with journalists. In brief, journalists depend upon them for their research projects and up-to-date facts and figures. The output of these connections comes in the form of news stories on climate change:

> Then we also have governmental organisations and NGOs, whose work is related to seasonal transformations and climate change. We have contact with them so we also get some information from them related to climate change—the experts of the field, people in WWF, IUCN, the experts about our agriculture and irrigation and we get a lot of information regarding climate change. We quote the documents and policy papers of this organisation. (Baluchistan: Interview 3, p. 4)

A common view among respondents is that a climate change story requires scientific evidence. For this purpose, local journalists depend upon the people working in the agriculture council, Meteorological Department and public sector universities.

> In Pakistan the subject of environmental science is not very popular. Therefore, we mostly approach the Meteorological Department, secondly the Agriculture Research Council, thirdly the National Disaster Management Authority, and fourthly the experts of local environment…. (Punjab: Interview 6, p. 9)

These organizations seem to have a specific role to inform about the scientific details of local climate change. For example, results of different experiments, explanation of scientific models and outcomes of various field projects, details of environmental changes, visible and invisible factors responsible for climate change and present and future impacts

are communicated through interviews, press briefings, press releases and in the form of documents such as research papers, articles, conference papers and books:

> We contact different scientists, asking, how long have you had this data? What is your data? What can be the data of the future? So this is the way we collect the data. They share it, findings, results, and also the latest developments related to climate change facts. Besides recordings, they also give us supportive documents or other related material at the end of the interview, or send it to us via email before or after the interview. Sometimes we go to libraries and come across different research studies. For further clarification we contact them, meet them and get relevant details. (Baluchistan: Interview 1, p. 5)

Other important sources for some respondents are global climate change research centres and international scientific institutes that provide up-to-date and reliable information. They do so via digital platforms like search engines (Google Scholar), YouTube videos, scientific blogosphere, climate science websites and online scientific journals:

> Books, the internet—these are the main sources and also those people who have done research on this subject, as they are experts so they have material related to it. There are different websites, researchers, and universities who have done research in this field, those who have done PhDs, those who have done research surveys, and those who are experts. Experts have so much material because they work in the field. (Sindh: Interview 10, p. 6)

Journalists access both local and foreign experts for scientific information. This information not only constitutes the building blocks of the story's outline, but also directs journalists towards other types of information to develop the story further.

The majority of the respondents believe that local communities are a major source of information for building local news stories because they can tell the real-world situation. They argue further that journalists are interconnected with the local community and their routine interactions with them produce a great deal of information about local happenings:

> First of all, our source for climate change stories is the local community of a certain area where the climate change story exists. Like when there is a

land erosion in a particular village due to flood waters or flash floods in the summer season, and the concerned community can share with me the best information about the land erosion, its past status and its historical perspective: whether the areas were hit for the first time by such disaster, or whether it had happened in the past, too. For such a story, the local community could be the main source for solid information. (Azad Kashmir: Interview 4, p. 7)

For some respondents, they learn about climate change through informal relationships such as family, relatives and friends. As one participant says,

we also have some friends who are working on the environment, so they give some of their stories to us. If we need some information then we contact them and then they give us some authentic information. (Baluchistan: Interview 1, p. 6)

While for other respondents, information is exchanged, discussed or produced unconsciously during formal encounters with people that have lived in these areas for a long period of time. For instance:

In society, there is also folk wisdom on such issues. When you visit the field then you come to know what the issues are and people also have some solution in the light of their local folk wisdom, and many times it will seem to be quite practical. In this way you also get to know situations and obtain information through a field visit. (Punjab: Interview 1, p. 11)

In this context, journalists discover details on the local events, issues and debates and possible solutions from the people's perspective.

Almost more than half of the respondents consider other national and transnational mainstream media as an important source of climate change information. They argue that this occurs when a news journalist uses information from other local and global news media outlets. The forms of such information are sound bites from celebrities, commentaries from experts, special reports on climate change conferences and summits, documentaries on the cause and impact of climate changes, news bulletins and stories on disasters and unusual events, and features and columns on climate change developments around the world. Journalists consider the *National Geographic*, Earth, Animal Planet, CNN, the BBC, Al-Jazeera, the AFP, the *Washington Post*, the *New York Times, Time*

magazine and *Newsweek* as important global sites for climate change knowledge. Similarly, they rely on local English news media, like the *Dawn* newspaper and the *Express Tribune*. Exemplifying the importance of other news media for information purposes, an interviewee comments:

> When different media houses, TV channels, and print media do some reports then we come to know what has happened, because the flood came as a consequence of climate change. What have been the losses? Therefore, the most important source of information is other media. (Sindh: Interview 10, p. 7)

In contrast, less than half of the respondents claim that the trend of using digital technology for communication is increasing day by day, specifically with the launching of smartphones in the local market. From their perspective, a large number of reporters use social media for first-hand information about any issue, event, disaster or unusual happening in their local environment. Social media provides a viral flow of information in visual and written format by people who are either affected by the event in question or are witnesses. Such people share videos on YouTube, or their status on Facebook or Twitter.

A few media respondents even state that mainstream media has a separate desk to monitor the traffic on Facebook, YouTube and Twitter to develop new stories. However, others challenge the reliability of social media and its limited access in far-flung areas of the country:

> Social media in today's era is a main source of information for getting first-hand information. … People often tweet or update their status to inform people and authorities about the incident. But you cannot fully rely on social media information due to false and misguided information and you have to rely on local authorities, the victims and communities. I use social media information as firsthand information but always do counter-check to confirm its certainty, which is essential to give correct information through mainstream media. (Punjab: Interview 9, p. 26)

Apart from this, respondents also acknowledge the role of technical actors such as information systems, reports, documents and other published material in the development of a news story. Take the example

of research journals that are information-rich and are used in different types of news stories as testimonials of the climate change phenomenon, including its causes and impact:

> Research journals are more reliable for me compared to newspapers and other policy papers of different organisations, because research papers provide more practical, more solid and …more plausible information. And … newspapers and different organisations and journals and annuals and biannual reports …are also a source of information about climate change. But I heavily rely on the latest research journals. (Sindh: Interview 5, p. 4)

Another respondent explains his use of documents for the development of his story:

> I got a survey report from the Geological Survey of Pakistan, which had conducted a research study in 2010 about the Muncher and Faker area about the effect of climate change. The report informed the government about the possible disasters and gave recommendation for taking appropriate preventive measures, and I got it for my stories. I read it, underlined the important ideas of the report, gathered a chunk of useful information and derived relevant information from it. (Punjab: Interview 6, p. 6)

Almost all respondents are of the opinion that after getting information from different stakeholders, journalists have to filter out the information required for the development of a news story by themselves. As one participant comments:

> I decide the final information for the development of the climate change news story after getting information from different stakeholders. (Sindh: Interview 6, p. 5)

Interestingly, journalists add that all the local, global, technical and digital sources are interconnected directly or indirectly. Therefore, simply connecting with one source enables access to diverse sources of different scales. For example:

> Just suppose that today you are an expert, I have taken your view and then I can ask you about the other relevant people in this field, those who can give us authentic data. So we get to know through them or through the

> policy makers of the government, then from the people who are doing research—we can get good data from them. Then on the other hand the internet is also another source, many organisations are working on it. So many organisations come forward who have worked related to it. Then we try to interact with them and in this way new sources are developed. (Islamabad: Interview 1, p. 5)

Additionally, respondents believe that the greater the number of resources, the higher the credibility of the news story. As one respondent claims:

> If we have more sources, we have more material, more angles, more ideas help us to critically evaluate the information…all this result a comprehensive story relating all aspects of the topic. (Azad Kashmir: Interview 1, p. 5)

From the above results, it seems reasonable to argue that local journalists have limited number of sources. In all cases, they rely upon state institutions, global bodies and NGOs for the climate change data and information, rather than climate change experts who are small in number but a real source of information. Local journalists bridge this information gap by connecting to foreign experts and international research centres via the Internet accessing documents or speaking to scientists directly on Skype or other Internet-based messaging or calling apps. Furthermore, there are no criteria for source selection; it depends upon the type of news story, availability of sources and timeline. However, in all cases, the most reliable and authentic source of information is the United Nations, followed by state institutions, NGOs, experts and local people. The most referred to actors are human actors (primary source of information) complemented by technical and digital actors (secondary sources).

Access to Climate Change Actoral Sources

Once sources are identified, the next stage is to access actors. For respondents, there are two different ways to gain actoral access: (1) physical and (2) digital. In the physical way, the journalist approaches human actors directly and engages in face-to-face interaction:

I visit government offices and meet the officials at the top hierarchy or other relevant person, I go to the field to record people's emotions and experiences …I attend different workshops, seminars and conferences where I get exposure to different experts and officials, and these events are a source of networking opportunities for me, and in this way I build up my sources, basically. (Punjab: Interview 2, p. 5)

However, in most cases, actors are not physically available. As one respondent exemplifies:

The Meteorological Department is in Islamabad, and I have to write a story on rising temperatures in my city (Lahore). I need scientific details so what I will do is send an email or text message or call Ghulam Rasool, the head of the Meteorological Department, and will ask him to send me the required data or tell me about its reasons. (Azad Kashmir: Interview 4, p. 8)

As journalists have tight schedules and have no time to travel to other regions to obtain information, they rely upon the nearest relevant department for information. In case of failure to get information at the local level, they digitally communicate with relevant sources. Furthermore, they state that their media organizations are usually not willing to pay them to go to other areas to obtain the information to write a story on a low-priority topic such as climate change. Thus, a pragmatic and most common practice among journalists is to use digital technology to access climate change actors for data:

Mostly we physically visit the offices of the relevant departments to discuss any issue with our sources and get information in this regard. If they are not available at their offices, then we use technology to approach and communicate with them via email, Skype, Viber and WhatsApp. (Punjab: Interview 5, p. 6)

The majority of the respondents explain their general routine as acquiring general information about the topic and the people working on it digitally first, and then approaching them physically. For example:

Whenever my office gives me an assignment, the first thing I do is to search on Google about the particular issue and find out the organisations that have worked on that issue; then I contact the officials of those organisations. (Azad Kashmir: Interview 1, p. 5)

For climate change topics, reliable and sufficient scientific data and information are available with state institutions but difficult to access. This encourages journalists to rely upon the Internet, web-based applications, smartphone applications and Google alerts to obtain global, up-to-date data about climate change:

> Basically, the internet is a major source of access to these information sources and I have even subscribed to different online newspapers and magazines like *Newsweek* and *Time*, which definitely provide me with information about the latest happenings in climate change and environmental issues in the developing and developed world. But if I want to have the latest information, websites are always the best source; but the more credible and reliable information comes from online research journals for me. (Punjab: Interview 7, p. 8)

In addition, a large number of respondents are of the opinion that they use physical means to approach local actors, while for accessing global actors, they employ digital means because of geographical constraints.

> Those who are present in the province, I will approach and contact them; but for those at international and regional level I will use the internet. I will contact them through Google and social media such as Facebook, Twitter etc. (Islamabad: Interview 7, p. 10)

The above findings suggest that journalists use both physical and digital means to access climate change actors for the sake of reliable data and information for their news stories. In brief, both physical and digital spheres influence the construction phase of the news production process.

Information-Gathering Process

The third stage is the process of obtaining information from climate change actors and relates to the way how climate change actors are involved. This process facilitates the flow of hard facts and figures from participants to journalists and is required for the development of the news story:

> Usually we meet the people to conduct face-to-face interviews, sometimes telephonic interviews, and these day Skype interviews, very often studio interviews and in certain occasions video conferencing, and ask

questions about any particular issue. They tell us, brief us, and share with us facts, ideas, and information about environmental issues. (Sindh: Interview 10, p. 8)

The above quote illustrates that informative sessions between journalist and climate change stakeholders produce the desired information for the news story. Notably, the process of information sharing is the same among all the actors; the only difference lies in the types of information required for the news story. This includes different types of informative interactions; however, the procedure to get information remains the same in all cases, i.e. devising preinterview questions.

The majority of the respondents note that information from the source is gathered on the basis of set of questions. Such questions are developed on the basis of their in-depth study of the topic. This includes field research and online browsing of information available on different websites. According to respondents, journalists design a questionnaire by following the principles of news reporting. As one interviewee reports,

First I tell them about the topics and then I put questions in the story by following the 4 Ws [What, Where, When, Who] and one H [How], and they answer me. (Khyber Pakhtunkhwa: Interview 6, p. 7)

However, a number of respondents believe that the news outlet determines the nature of the information required for the news story. For instance, if a journalist is working for radio or TV channel, then they have to mostly record sound bites and visuals for airing it. If they are working for print, then they have to do both, i.e. recording and note down the information (Khyber Pakhtunkhwa: Interview 5, p. 8).

As far as modes of interviewing are concerned, respondents report that they start with indirect questions leading to direct ones about the topic. The reason is that interviewees take some time to become familiar with and earn confidence in the journalists. Furthermore, in many cases, the participants are state officials that are not willing to share information unless they have a certain level of trust and confidence in the journalist.

Due to tight deadlines and having to handle a number of 'beats', journalists prefer to access information in the form of documents:

There are 2-4 sources, they are given the printed material or we give them time to provide us information related to these things. They search for

us and then send it to us by mail, or sometimes the material is available
at their premises and they give us permission to go and have a look at it,
or they give us printed material such as journals, magazines etc. (Khyber
Pakhtunkhwa: Interview 5, p. 6)

They use email and smartphone applications to send questions and get
their responses from the concerned persons and download 'green' appli-
cations on their smartphones to get scientific data, while some of them
use Google to answer their queries about climate change:

Google Earth has been introduced, and now you can go back to the
past … what was Earth like in 1992? How was this area in 2000, 2002,
2004? … But now you tell me, has any journalist written a story using
these tools? Has anyone ever said that this is how the city was like in 1998?
In 2014 Google Earth can be used for this … but journalists do not know
these tools. (Punjab: Interview 10, p. 7)

In the light of the above results, it can be argued that the information-
gathering process facilitates the journalists to collect relevant details
for the development of the news story. However, the process is not
complete with the gathering of information. Rather, it needs two
further steps, namely verification of the information and final com-
position of the news story. Both these steps fall within the postcon-
struction phase of a climate change story, which we will discuss in the
next section.

Postconstruction Phase of Local Climate Change Story

The production of a climate change news story is comprised in two
stages: (1) verification and (2) composition of a news story. In this sec-
tion, we will discuss how journalists' dependence upon global and local,
social and technical, and physical and digital actors is used to check the
accuracy of the information and to shape the news content and format.

Verification of Climate Change News Stories

After collecting relevant data and information from various sources,
the next step is the verification of information to satisfy the journalistic
canon of objectivity. Some respondents practice the tenet of verification

while reporting climate change news stories, while others believe that it is not a common practice among local journalists to verify statistics of their news stories.

There is also a clear distinction between two types of journalistic practice:

For some respondents, only English media journalists observe the principle of confirmation of information, because their target audience are educated and from the top hierarchy (e.g. military, political and civil elite) of society. In contrast, from these respondents' perspective, the target audience of Urdu media (specifically broadcast media) is the general public, who is not literate enough to differentiate between information. Some respondents believe that accuracy in news stories is a 'remote dream', as the media has neither enough time nor ample financial resources for journalists to conduct in-depth investigations, which can be time-consuming and expensive.

Furthermore, climate change news reporting is a highly technical and scientific subject and demands a high degree of accuracy from a news reporter. That is not practically possible in Pakistan due to inadequate, poor quality and out-of-date information. In brief, local journalists are engaged in verification of source information, but it depends upon the nature of the story, time constraints, type of media outlets and above all number of available resources at a time. The following interview extract refers to the process of verification at the local level:

> The method to check accuracy is similar to what we do for other stories. We need to check the accuracy from the relevant organisations… if there is any government report then you will have to further counter-check it with non-government organisations. To do so, you also need to take the opinion from the experts about whether this thing has come from the government's side, so is it really so? And we have to take the opinion of the conservative part too, about whether this thing, which has come from the government's side, is a reality or if they are some conservative figures. (Punjab: Interview 9, p. 23)

Another example illuminates the specifics of a verification process:

> An Australian team visited Attabad Lake and compiled a report on the artificial lake which developed after a disastrous landslide in 2010. This report addressed serious findings about the lake as far as its future threats, and

later on, various national and international media outlets published the report; I too used it. Then FOCUS Humanities, a non-governmental organisation, also published its own report about Attabaad and the local media also reported it. Similarly, WFO also visited Karakorum International University and compiled a report about the agriculture in Gilgit-Baltistan, and the local media also published about it, after national media. (Punjab: Interview 1, p. 4)

In this case, each subsequent report is used to verify the previous information to make his or her story credible. Some respondents indicate that the greater the number of sources, the higher the reliability of the data:

> The more sources you have the better your story will be, meaning that if you interact with the maximum number of people—then your story will be very good. Sometimes confusion is also created but most of the time, the story is made good by involving more people into it. There is no doubt that a substantial story emerges [in those cases]. (Gilgit: Interview 5, p. 8)

The above response also suggests that multiple sources may incite chaos if the journalist fails to decide on credible sources of information. However, a few other respondents claim that repeated relations in some cases can also yield more reliable facts and figures for the story:

> The chain of interaction sometimes helps to get better data. Maybe other ideas will come to you, which are better than the idea that you have right now. So if there is accuracy and the data is real, then the angle of your story can be changed—more substance can come into it, you can develop it in a much better way. (Baluchistan: Interview 5, p. 9)

In response to the most reliable source for confirmation of climate change information, the findings of the study indicate mixed responses. The majority of the respondents argue that they verify data from the official sources such as the Meteorological Department and the Climate Change Ministry, because they are the only available sources for journalists to verify the information at the local level. In certain cases, the information is not correct, but it is still believed to be correct, as one respondent argues:

> If they have given you some stats, even if you don't accept it, you definitely still have to quote it. (Islamabad: Interview 9, p. 7)

State sources are used as they are seen as the 'custodians' of reliable and authentic data. Verification is accomplished by contacting people at the top of the organizational hierarchy. Normally, they are the heads of the organization:

> I am a journalist. I am not a climate expert. If I say there is story in Pakistan you know glaciers are melting, if I come through with this information there has to be a strong source to rely on for me, because I am not a researcher, scientist, climate expert, or a policy maker, which has firsthand information. So definitely I am supposed to or have no other option than relying on these sources like the government, government ministers or government policy makers, scientists, and researchers who are really engaged with the core issues. They definitely become reliable for me because they tell me exactly what has happening. (Sindh: Interview 5, p. 9)

These findings are in line with research that states that official sources are credible sources of information for journalists to observe the canon of objectivity (Allan 2004; Cottle 2009, 2013; Cox 2015). More than half of the respondents indicate that they rely mostly on scientific organizations and scientific experts to check the statistics of a news story:

> In my opinion, people without firsthand information or those with no expert opinion, will not be able to establish their authenticity among the readers, listeners and viewers because they want to know who has verified it and checked its authenticity. Obviously a journalist is not the authority but rather the expert is its authority; it is the expert who attests the information or rejects it. If she or he rejects or confirms information then the story further becomes powerful—it enlightens the story, or makes it more beautiful or it further increases its authenticity and reliability. (Sindh: Interview 9, p. 7)

As the majority of the respondents note, most of local scientific experts work for state, civil society and educational institutions. Consequently, their data may be biased as they are influenced by their respective institutions. This highlights the need to counter-check the scientific information with another expert. However, this is not always possible, as Pakistan is facing a shortage of climate change experts, which affects the authenticity of news:

> Usually you are not taking any second opinion… if there is a discussion about marine life, you only have 1-2 experts who speak about it, so that

is the ultimate thing because who will you counter-check with? Here you don't have think tanks nor you have university professors who can speak about it. Therefore, you are bound to rely on [the first sources]. (Khyber Pakhtunkhwa: Interview 5, p. 7)

In this scenario, respondents claim, journalists contact internationally recognized scholars for verification purposes, who are considered as reliable sources.

A common practice among local journalists wishing to obtain precise data is to visit the area and indulge in face-to-face communication with the locals. Such public communication helps them to determine the accuracy of information. For instance, a respondent reports that in case of 10% increase in temperature from 40 years ago, he will go to an elderly person, who has more information because of having lived through this change. In this way, he will get confirmation of his information (Baluchistan: Interview 7). An English news journalist stated:

I also take into account eyewitnesses and also go to that place myself and understand the issue and talk to people. This is how you independently verify [a story]. The expert has given the opinion but at least you have to go to the witness and talk to them, talk to the affected people. This is how things are further developed. (Sindh: Interview 1, p. 9)

For media respondents, global organizations such as the United Nations and the World Bank are believed to be the most reliable sources to verify information. Respondents argue that there is no need to check the accuracy of these organizations because of their authenticity and international reputation. As one respondent puts it,

You trust the research done by some research-based organisation whose work is related to this topic. Just like UNICEF has done research, WHO has done it or some other big organisation…We don't bother to check the accuracy of the reputed international media because we cannot challenge its authenticity, because of its reputation. Like if any UN report is published by any international media like the *Financial Times*, then I think there is no need to check its accuracy. When you quote the UN then you cannot check it and you have to take it for granted. (Punjab: Interview 8, p. 8)

Another routine practice of local journalists is to verify information from non-government organizations, especially after using state sources:

> There is much reliance on them. It is obvious that if it is an expert, or some organisation like the IUCN and WWF—this sort of important organisations, so you can rely on them. (Sindh: Interview 1, p. 8)

However, a large number of respondents critique local NGOs for their failure to provide data in the local context. For them, such organizations engage in plagiarism by copying international data and applying it to the local context. This creates contradictions in the results and the real situation.

To counter the challenge posed by the tenet of accuracy of data, as perceived by the respondents, journalists get an endorsement for their facts and figures from the international sources available over the Internet in the form of websites, the blogosphere, online news media and social media. For some respondents, Google is the most authentic database to get verification of statistics of the news story. They argue that they usually visit the websites identified by Google as top sites for the relevant information. However, some respondents do not trust Internet sources, and they rely on it only to a certain degree, because the real purpose behind some sites is unknown and there is no yardstick to measure the accuracy of their information. For others, the verification of a website is done on the basis of personal judgement, i.e. how many people read it, visited the websites and liked it. A practical example of digital verification is evident in the following quotation:

> Well I make sure I quote a lot of scientific data and I make sure that the numbers are accurate, and then of course everyone makes mistakes but I really double check and triple check like I said. The internet is a really good source. You can Google something and you can get the exact number, for example, how much energy it takes to mix coal and how much is gas and how much is hydropower, and that's a difficult figure to come up with. But the issue arises when you go to the DAWN's website and they give another figure … Sometimes it's difficult to get accurate figures. Then you really have to find the government's figure on the Climate Change Ministry website, and if it's not right then you can say approximately…. let's say four per cent or seven percent, etc. (Punjab: Interview 7, p. 9)

The quote above indicates that journalists rely on websites and Google to search reliable data for their news stories. In brief, the Internet has eased the work of journalists and brought more accuracy and objectivity to their news stories.

Some respondents think that journalists in general cross-check the information for their news story with local and global new media outlets that are considered authentic because of their editorial check. As far as the information from major media outlets like the BBC, CNN, National Geographic or our own reputed national media organizations is concerned, accuracy is not so much a concern because they have systems to check the information before making it public. For other respondents, the information is exaggerated and it needs verification from local sources. For instance:

> So I verify the story from other news websites … if the same story has been published in different newspapers of highly reputable organisations then definitely their stories are automatically credible. If a story is published in Newsweek and the same story from a different angle is published in the New York Times, then I cannot deny the truthfulness and veracity of the story. A story is really credible in this way if it is published in a newspaper of highly reputable organisation or global reputation. (Punjab: Interview 4, p. 23)

In addition, information is verified through local news media outlets. For instance, the *Dawn* and the *Tribune* have higher credibility than other newspapers and channels because of their objective reporting:

> Locally, you have to be careful about the accuracy, particularly about those media sources that have less credibility. Yes absolutely, if your source is weak then your story will be weak and unauthentic. And if your source is strong and responsible then it will further strengthen your story making it more credible and responsible. (Gilgit: Interview 7, p. 6)

In addition, the majority of the respondents are of the opinion that the reflective thinking of the journalist plays an important role in determining the accuracy of facts and figures for a news story. They argue that journalists always give a second thought to the information they get from the source and verify it from more than one source. Most often sources have hidden agendas or communicate manipulated information to the journalist:

So, it is your personal strategy, which determines how you assess who is writing the truth. I consider facts. I have my own understanding that this issue will be based on facts or this is a general perception… It is my own judgement, a personal judgement. (Sindh: Interview 9, p. 8)

Most interviewed journalists claim that they check the accuracy of data from the secondary documents recordings, notebooks and official files; in some cases, they obtain the required information from the websites of related departments:

My personal methodology is that I mostly rely on the documents from the government—those things, which are verified and attested… I also have manual records. The documents presented in Parliament are also included, their government records are in it. The accuracy is checked through them too. (Khyber-Pakhtunkhwa: Interview 6, p.3)

They verify local information using global data by making comparisons; in case of a high discrepancy, they give more weight to foreign sources because they are believed to have up-to-date scientific data, collected by following systemic procedures and using the latest technological equipment. A respondent exemplifies this in the following manner:

As a very small example, when the earthquake comes then there is some difference in the points of the assessment of US and Pakistan Meteorological Department, meaning if we will be giving 7.0, then the US will be giving the same thing a 6.7. In this, definitely the US is the more reliable one. They have a proper department in which they measure the intensity of earthquakes … according to American geological surveys the intensity of the earthquake was 6.7 … in the story they are mentioned separately. If the climate change statistics come to be parallel, then both are mentioned. (Baluchistan: Interview 2, p. 10)

For some respondents, global information is not always correct because of assumed subjective interests of the foreign bodies who may distort facts to portray a negative image of Pakistan, so they verify it from local sources. For instance,

They are saying climate change that the phenomenon is affecting our agriculture sector to the mountains in Pakistan, I am not going to take it at face value. So I would visit the local field, I would talk to the people I

would get, because they know best … though most of them they would not understand the climate change phenomenon, they would tell me that in the last 10 or 5 years they've had abrupt climate or abrupt environmental behaviour and they are really hurting their life and livelihood. So I always go back to local people. (Sindh: Interview 5, p. 8)

As illustrated by the findings above, local journalists verify the acquired information through a number of channels. There is no set pattern to verify the information, and it all depends upon the personal judgement of the journalist to decide the accuracy of information. This highlights the subjective objectivity of the journalist, in contrast to the traditional view that journalists employ objectivity to follow the professional code of media ethics (Cottle 2013).

Composition of a Climate Change News Story

A large number of respondents argue that local journalists have little knowledge about writing climate change news stories. When composing climate change stories, local reporters interact physically with their colleagues working in the same or different news media outlets at the local level and interact digitally with colleagues living in other parts of the world, working for different national and transnational media organizations. It is assumed that these contacts have background knowledge and experience in writing climate change news stories. During the interaction, they share and discuss ideas with colleagues, and in return, they obtain reviews and guidelines:

Sometimes I go to meet my colleague within my organisation or go to his office or public place or to the press club where all the journalists usually come and sit together in the evening. Sometimes I call my friend and ask about the format of his climate change story and discuss my story with him. Other times I read, listen or watch news stories from my colleagues and get ideas how to better frame my story … on climate change, which gives me clear-cut guidelines on how to design the layout of a climate story. (Gilgit: Interview 5, p. 8)

This is confirmed by Cottle (2009, p. 19), who argues that it is the 'deployment of vocabulary of precedents that help them to recognize, produce and justify their selection and treatment of news stories'.

Computer systems, audio, video and language editing software, and even a number of Web tools are used to produce news stories:

> Long ago we used to write stories on paper and it takes too much time to write and rewrite the stories, but now conditions have changed and now we write stories on our computers, laptops and notebooks. We use MS Word, Inkle Writer, in-page Urdu software and other inbuilt and online tools. They save us time and help in writing better stories. I think that technology improved the writing of journalists. (Punjab: Interview 7, p. 9)

Similarly, an electronic media journalist stated:

> I prepare the news script by using an Urdu script editor and Adobe Photoshop. I use video tape recorders for visuals and sound bites for the news packages. I also use audio and video editing software like AVS and Cyber link for my script writing. (Punjab: Interview 8, p. 7)

Almost more than half of the respondents report that their immediate superior—a news editor (newspapers), bureau-in-chief or director (television news, controller news or radio)—influences the final version of the news story. According to respondents, this process varies from organization to organization, as journalists work for different news media outlets and each news media outlet has its own format, style and pattern:

> As journalists we construct the story according to the medium of communication. I am a print media journalist so I will write a story according to the format and guidelines of news stories writing in the newspapers. My colleague is an electronic media journalist, so he will make a news report or documentary or talk show according to the news patterns of electronic media. If he is a radio journalist then he will use an oral format, having more sound bites rather than other media. If I were a freelance journalist, I would upload my videos to YouTube and Facebook, or I could write blogs. (Punjab: Interview 4, p. 15)

There are degrees of reliance upon other local as well global mainstream and new stream media to compose a news story. Here, the reporter copies the format, structure, style and even the content of the published or broadcasted news story:

> Climate change is a technical subject so it's different from a routine story. Once or twice in a month … For its writing I follow TV channels such as Geo, Ary, Dawn, BBC, CNN and newspapers like *Dawn* and *Express Tribune, Washington Post* and *New York Times* and online news websites like *The Guardian* and Third Pole Net. Basically I see structure, layout, the words, language, and technical terms and how fellow reporters structure facts, quotes and details. (Baluchistan: Interview 2, p. 7)

Socialization, educational background and professional experience shape their news writing style. Language skills, use of vocabulary and writing style vary from journalist to journalist:

> I write what I think … I develop my story in my mind then write it … I think, think and rethink, make a blue print of what to write, how to write, what details should be the first, what details should be at the end, what quotes should be included, and what excluded. (Khyber-Pakhtunkhwa: Interview 2, p. 6)

The findings indicate that journalists employ all human, technical and digital actors to compose his climate change news story.

Based on the above discussion, we argue that climate change news journalism is practised in a logic of combining complex intersecting layers of local and global, physical and digital, human and technical actors.

Interconnecting Local Climate Change News Communication

Stories are submitted to their immediate superior, in most cases a news editor, director of news, controller of news and bureau-in-chief who edits the story and decides the timing, place and medium on the basis of these editorial strategies. In other words, journalists at the top of the media organization give directives to send the story to the printing or broadcasting department or spatial media department for public communication:

> I send the story to my editor, who reads the story, makes some changes and finalizes it. They then decide the page and number of columns for it. (Sindh: Interview 8, p. 9)

Similarly, an electronic media journalist stated:

> Whenever I produce a package on the environment, I deliver it to the bureau-in-chief who decides the duration of the package, whether it is three minutes or six minutes, and fixes its slot during prime time or another time. (Punjab: Interview 8, p. 9)

For a small number of respondents, digital networks help journalists to communicate their messages directly to the public, who does not have access to traditional media. In this case, journalists have Facebook and Twitter accounts and their own personal blogs to share their stories. It is a common practice of local journalists to produce their published or aired story in the form of text, images and sound to go viral on the Web 3.0. For example, a columnist, anchorperson and writer have Facebook pages where their columns in different newspapers and programmes are shared with the public (Punjab: Interview 4). Some journalists also write separately on their blogs and share the stories in addition to the media organizations they work for in their capacity as reporter, editor, etc.

A few respondents declare social media an alternative platform to share their climate change news stories, which fail to occupy a place in the mainstream media but through digital media can receive global attention. This suggests that journalists communicate to the local public through local media while communicating to the global audience through digital networks.

Apart from this, respondents also highlight the forms of communication. To this end, a large number of respondents refer to textual communication, which is generally targeted at the local population and the political and military elite, and help them engage with the information embedded in the text. Examples of this are the local Urdu, English and vernacular language newspapers. Audio communication is used which reaches local people, specifically the rural community, and captivates this audience with climate change information in the form of sound bites. This is best achieved via radio news networks.

The majority of the respondents mention audio–visual communication, which is national and cross-national at the same time, and encourage oral–visual interaction of the audience with the programme content. The best examples of this form are television cable news networks and

terrestrial and satellite channels. Almost all respondents comment on AVT (audio, visual, text) communication, which is suitable for spatial media and social media (Cox 2015). This builds online relationships with the globalized public on the basis of AVT interactivity, which gives the audience a complete scenario of climate change issues.

The above findings suggest that journalists engage with the local and global audience via physical and digital communication. This is in line with traditional media approaches (Cottle 2009) that argue that journalists are aware of their target audience.

Local News Sphere: An Outcome of Journalistic Cosmopolitan Relational Practices

Summarizing the above findings, it can be argued that climate change news production is neither in the local nor in the global sphere, but rather in a cosmopolitan sphere of news construction because of journalistic relational interconnectivity with local and global, physical and digital, and human and technical actors. Such cosmopolitan interconnectivity is reflected in the content of climate change news stories and also guides journalists to complete all three phases of climate change news production. During the preconstruction phase, journalists employ different actoral sources to get ideas for their climate change news story. As soon as the story topic is finalized, the journalist identifies potential climate change actors for the development of the story and employs physical and digital means to gain access to them, as well as informative interactions to get relevant data and information. After finalizing the information, journalists become involved in another actoral process for data verification, followed by identifying the method for composition of the news story. Based on these diverse processes of subjective construction of climate change, we might argue that these formal processes addressed above constitute a 'subjective objectivity' achieved during the relational interaction with different sources of information (Volkmer 2014). Journalists rely upon mainstream media for indirect communication with the public and social media for the direct delivery of message to the public. Thus, it may be argued that the cosmopolitan nature of journalistic actoral relationships helps journalists produce climate change news stories at the local news sphere and disseminate them back to the cosmopolitan sphere of climate change communicative flows, where it is processed by different climate change actors. These actors reside in the local, global
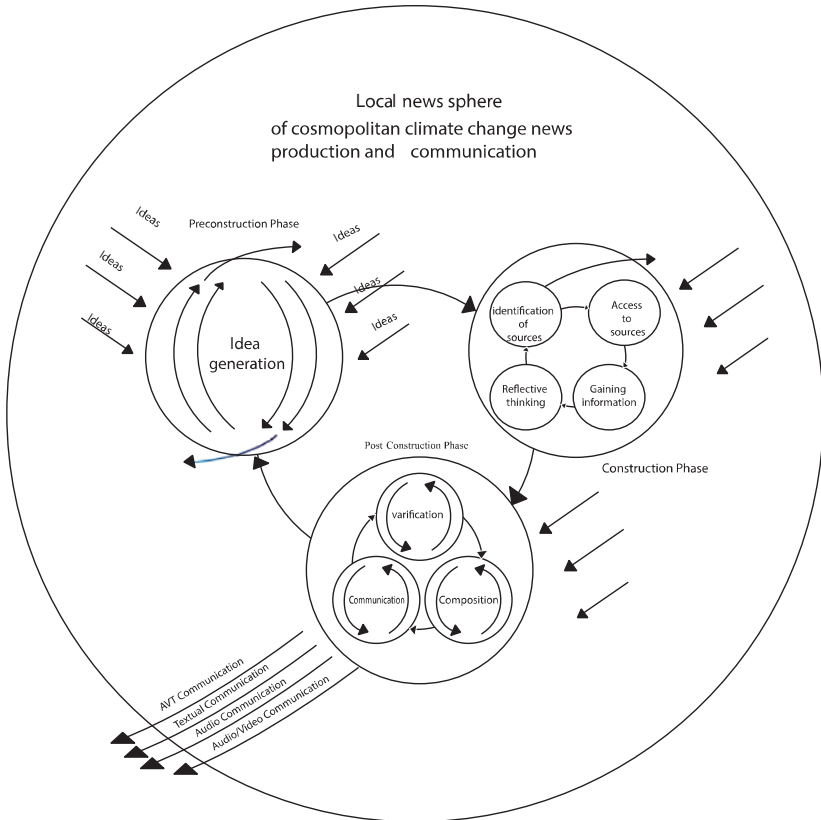
Fig. 7.1 Local news scale: an outcome of journalistic cosmopolitan relational practices

and digital arenas, which altogether are part of the cosmopolitan sphere of climate change communicative flows (see Fig. 7.1).

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Cosmopolitan Relational Loops of Interconnectivity

Climate change can no longer be considered as just an 'issue' but it is today an increasingly politicized globally interdependent crisis. Within this spectrum, climate change journalism—or, we argue, 'risk journalism'—has new responsibilities to communicate the interdependence of globalized crisis dimensions within a world community.

In 'risk' journalism research, methodologies are needed to address not only the internationalization of climate change coverage of 'issues', 'agendas' and 'frames', but we also require research, assessing the way how these new types of crisis magnitude is addressed as 'cosmopolitanized' reality. A shift towards methodological interdependence allows to gain insight into the emerging fine-lined figurations of politicized 'scales' and the way how journalistic practice operates 'on the ground' in this new field. It gives insight into how journalists—often without a science background—seek information digitally, interact with international key experts and policymakers, such as on Skype or interactive apps, use Google Earth to identify the implications of climate change globally but at the same time, they relate these interactions to local implications and interact with local politicians and NGOs in order to 'make sense' of the looming global crisis and develop a specific 'logic' in their individual 'risk' journalistic practice.

Our work aims to identify these practices in-depth. Our study shows that climate change journalists, despite being 'locally' focused—and

situated in a developing country—are fully integrated in emerging epistemic 'scales' through access to all types of globalized discourse through digital spheres which enables a new dimension of journalistic practice across societies: a jointly shared cosmopolitanized 'reflexivity'. As has been outlined in Chapter 3, the conceptualization of 'scales' as an epistemic figuration across societies allows to identify the 'links' which are invisible in a national approach. The scalar approach (which is already a subject of debates in social sciences, see Chapter 3) is in our view becoming increasingly important as—given the density of digital fragmentation—a turn to the 'subject' and—in our case—the 'professional' is needed to assess the 'reflexive' scales of individual 'risk' horizons, in our case among journalists, produced through the engagement in diverse discursive spheres.

Our approach builds specifically on the conceptions of 'scales' as outlined by Saskia Sassen (2010). 'Scales' are in her view crucial dimensions of social science research. Scales are 'global dynamics' which 'destabilize older hierarchies of scale constituted through the practices and power projects of past eras, with the national scale eventually the preeminent scale' (Sassen 2010, p. 5). Sassen sees alternative scales emerging, such as 'powerful firms', 'global cities' and 'horizontal global civic networks' denationalizing the state (Sassen 2010, p. 6). In her work, 'global scalings' cut across all types of states and constitute an important new conceptual angle to dissolve the normative 'thickness' of the national paradigm in social research (Sassen 2010).

We adopt her term of 'scale' to illuminate the way how climate change journalists from developed to developing and 'failed' states engage—despite their different geographical locations—in jointly shared scalar dimensions of globalized discourse and diverse globalized knowledge fields. Our approach specifically aims to assess how journalists engage in such a scalar globalized dynamic. We assess the epistemic 'logic' of journalistic practice operating in these 'scales'—in our case study of Pakistani local journalists—but the approach could also be adopted to assess the practice of journalists in the USA, Brazil, Fiji and Indonesia or Sweden.

Our approach builds specifically on four components:

It is a (1) scalar approach to assess (2) epistemic spheres through a focus on the journalist as an (3) actor, constructing not 'just' a climate change story but communicating (4) the cosmopolitan reality of climate crises.

Our study has chosen a developing country, Pakistan, as a site to 'test' the approach of methodological interdependence of journalistic practice through a focus on 'reflexivity' across 'scalar' dimensions of globalized

risk discourses. Results reveal that journalists are not only highly aware of the climate change crisis and are very active in engaging with all kinds of digital sites, with local actors and international 'Western' media which, in some cases, are used to set the local agenda in a specific local region of Pakistan. The study also reveals how climate change is related to a geopolitical dimension. Our study allows to chart the specific interrelated 'scales' of news production practice across these globalized knowledge fields.

Overall, it can be argued that, although Pakistan is seen as a developing country, journalists are highly involved in international discourses. Our study has provided insight into how these diverse digital sources including scientists, the U.N. and documents of the International Panel on Climate Change (IPCC) are perceived and intertwined, and how these processes reveal a 'reflexivity' of journalistic practice in a spectrum of a globalized risk.

In contrast to approaches of constructing climate change reality within national boundaries, the findings of this study reveal different intertwined epistemic 'arenas' (Hilgartner and Bosk 1988) as the construction sites of the cosmopolitan reality of climate change.

In the assessment of epistemic dimensions of the way how the cosmopolitan reality of climate change is constructed, it is important to move away from traditional distinctions, such as old vs new, local vs global media and physical vs digital media, and begin to conceptualize nonlinear transnational flows of climate change information as 'satellite, Internet, digital television, and mobile devices...reveal[ing] the limitations of traditional methodological approaches' (Volkmer 2012, 118). This emphasis is needed for identifying a transnational/supranational and interdisciplinary framework that could contribute ontologically, epistemologically and methodologically to climate change media research. To do so, this study identifies relational scales of interconnectivity as an approach which builds on conceptions of de-territorialization as addressed in social sciences (e.g. Harvey 1990; Giddens 1991; Ritzer 2001; Beck 2008; Castells 2009; Urry 2007; Sassen 2008; Crossley 2011; Herod 2010; Volkmer 2014), the assessment of journalistic perceptions of transnational flows of climate change communication and local news production practices.

This study specifically suggests a framework, based on the 'scalar' approach, of cosmopolitan relational 'loops' to assess 'reflexive' scales.

This chapter is divided into four parts. The first part is an ontological contribution towards a conceptual model along the 'axes' of actoral interactions and relational scales that—together—shape the

cosmopolitan scale of climate change communicative flows. The second part outlines the epistemological contribution of such a model for climate change communication research explaining how these relational practices of local journalists with different cosmopolitan actors affect climate change news production, its content and its reception. The third part suggests actoral relational loop analysis as an alternative methodology to conduct social and media science research on the cosmopolitan risk of climate change. The final part highlights the limitations of the study and suggests the wider future implications of the model for transnational and trans-local media research on climate change communication.

ONTOLOGY OF THE COSMOPOLITAN RELATIONAL LOOP(S) OF ACTORAL INTERCONNECTIVITY

In contrast to traditional approaches of climate change communication (Cottle 2013; Anderson 2015a, b; Hansen 2015a; Cox 2015) and building upon the physical (Herod 2010), digital (Harvey 1990; Giddens 1991; Castells 2009) relational (Crossley 2011), public (Volkmer 2014) cosmopolitanization (Beck 2008), the findings of the study aim to widen the scope of climate change discourse, from the national perception versus global risk-dichotomy to the intertwining of cosmopolitan risk reality and local perception-dichotomy on the basis of four assumptions: (1) its omnipresence across the local, global and digital scales in the form of similarly delivered real-world events, issues and debates, identical patterns of human sufferings, parallel policies, identical procedures and measures and sameness of communication strategies; (2) glocal interconnectivity in terms of (a) casual relationships, such as local effects of global climate changes and global implication of local climatic changes and (b) problem/solution-oriented nexus in the form of global policy for local climate change actions, and local policies for achieving global climate change risk reduction goals; (3) physico-digital interconnectivity in terms of flows of climate change information from physical to digital platforms and vice versa and (4) the cosmopolitan nature of climate change actors, who are almost present on every scale and whose activities cross local, global, physical and digital scales.

The focus of the 'cosmopolitan relational loop' model of the construction of climate change is the actoral interactions that take place within and across 'scales'; such interactions, we argue, are the

compilation of the reciprocal actions of human, technical and digital actors and frame the social, political, cultural, economic, scientific and communicative dimensions of climate change risk.

It is important to be aware of an increasing 'density' of the climate change discourse as compared to about a decade ago. As has been argued earlier, the policy advancements of the IPCC and the formation of contours of global climate governance have implemented a density of the climate change discourse. While it is often argued that climate change is mainly a topic of Western publics and journalism, whereas journalists of other world regions, such as developing countries, are less engaged, our study has shown that the complexity of the climate crisis is a key theme also in a developing country, such as Pakistan.

However, it is useful to outline the—increasingly dense—transnational 'scales' of climate risk interaction in a globalized context which constitute spheres of interdependence across societies crucial also for local journalistic practice (as outlined by our results).

Broadly speaking, a first type of such a dense transnational 'scalar' dimension is critical human–nature interactions, which include the use of coal fuels and nuclear plants to fulfil the energy needs of societies; they initiate the chain of worldwide ecological changes and refine notions of climate change risks. A second type of transnational 'scalar' interactions could be described as techno-scientific interactions, such as climate science experts developing scientific models to explain the phenomena of climate change including its causes and impacts and develop possible solutions to counter it. Examples of these are the phenomena of global warming as explained by different scientific models: the gap in the ozone layer, floods, earthquakes, rising sea levels and glaciers melting in the Antarctic region described to the world by scientific studies and experiments conducted by scientists and scientific institutions. A third type of transnational 'scalar' interactions might be defined as material interactions, which include grants, loans, foreign aid, donations, subsidies, reduction of taxes on green goods, carbon crediting, paid media advertisements for public awareness campaigns and sponsoring other climate change activities (including scientific research projects or local projects by states, international bodies and non-government organizations) to tackle the challenges of the globalized risk of climate change. A fourth type of transnational 'scalar' interaction is informative and addresses climate change in social, political, economic and cultural implications. As has been shown in our study, journalists are engaged in

informative interaction with climate change actors to obtain the relevant information needed to evaluate, judge, appreciate and criticize the role of stakeholders of climate change. The fifth type of transnational 'scales', conflicting interactions, are a hallmark of the cosmopolitan politics of climate change, reflecting the disagreement and difference of opinion among climate change actors about its risks, causes, impact and possible measures. For example, conflict-oriented debates, negotiations, round-table conferences, summits, discussion and criticism of policies among developing and developed countries over the issues of reducing carbon emission, the burden of responsibility over developed countries and the demand of more effort from them in terms of funding and technical help to the poor countries, who are victims of climate change and whose contributions to global emissions are minimal. In addition, the sixth type of transnational 'scalar' interaction are problem-oriented interactions, which are mainly used to construct climate change as a problem on both local and global scales. In the local case, news media highlight and amplify that issue and communicate it further to the general public and decision-makers. As a result, civil society organizations become active and start putting pressure on the government. Policymakers, being informed by the media and pushed by civil society activists, take notice of these issues and involve other stakeholders to debate the issue and analyse its different dimensions. The outcome of these debates is the construction of climate change as a local problem. Problem-oriented interactions also apply to the global level, where state and non-state actors sit together, identify the issue and debate on its causes and impact. Specifically, problem-oriented interactions at both global and local levels construct climate change as a problem being faced by the citizens of the world.

A seventh type—again constituting a transnational scale—are solution-oriented interactions, which provide the much-needed framework to nation states, non-government bodies and the scientific community to negotiate and suggest various measures and arrive at different proposals for the solution of the problem. In addition, there are communicative interactions, which aim of communicating knowledge and information about climate change. For instance, they occur between scientists and the media, between the media and the public or between the media and politicians. It could be argued that policy interactions summits and conferences, resulting in global and local policymaking to address climate change issues also constitute a transnational 'scale', for example the global UN policy of reduction of greenhouse gas emissions.

Procedure-oriented interactions, a ninth type of transnational scalar interactions, comprise actoral activities whose goal is to provide a step-by-step guide and methods to implement climate change policies. Lastly, transnational 'scalar' interaction includes implementative interactions, which structure the relationships between actors, the goal of which is to implement climate change adaptation and mitigation measures and their communication to the local population as well as the global world.

From Transnational Scalar Interactions to 'Loops' as Relational Scales

These 'scalar' transnational interactions are important building blocks to construct climate change risk on the local level. We understand as a 'relational' scale the sphere where the cosmopolitan notion of climate change risk is produced, constructed, contested and communicated via complex dynamic actoral interactions in journalism practice.

Applying the notion of relational scales to journalism practice allows to focus on actoral interactions in the production process and to identify a model to assess the specific 'logic' of climate change journalism in such an interdependent sphere. We suggest a model of specific 'loops' to identify discursive procedures in the process of climate journalism practice.

Based on our study results, we distinguish between 3 types of loops: (1) loco-digital relational loops, (2) loco-global digital relational loops and (3) globo-digital relational loops.

1. *'Loco-digital relational loops'*

In the context of developing countries, climate change is not the government's top priority; it does not have sufficient funding, knowledge and technology to deal with climatic change. Therefore, it has to interact with global bodies, superpowers and developed countries to help address local climate challenges. Furthermore, industrial interaction is also sabotaging the process of climate change policy, the enactment of rules and regulations, and the necessary action for its implementation at this stage. The findings of this study suggest that the media, who have political relations with the state and the industrial sectors, seem to fail to perform its role in increasing public awareness and acting as a watch-dog over the government's developmental and industrial projects, by confining coverage to disaster reporting. Thus, the loco-digital relational

loop makes it possible for different actors such as government, media, the scientific community and civil society to engage in problem-oriented interactions at the loco-digital scale. Consequently, problems are debated and issues are identified and communicated to the public through media interaction. However, there are no solution-oriented interactions due to the lack of funds, experts and technology. All this leads to the second phase loop, the local-to-global (loco-global) relational loop.

2. *'Loco-global relational loops'*

The loco-global relational loop is comprised of different forms and types of interactions among local and global actors at a loco-global digital scale. The goal of these 'loops' is to spotlight local issues of climate change and to communicate them to global players in order to figure out their material, informative and technological collaboration, so as to address challenges of climate change at the local level. In brief, the loco-global relational loop facilitates the smooth and consistent flow of climate change information to the global digital relational loop, which is the next phase of the model.

3. *'Globo-digital relational loops'*

The third phase of the conceptual framework is the globo-digital relational loop of interconnectivity. A good case is the UN platform, where all state and non-state actoral actions and reciprocal actions take place. Here, the first type of interaction is problem-oriented, where a local problem derived from climate change is first identified based on the feedback of the affected country, and studies from the scientific community are then discussed and debated to give it the status of a global issue. This is followed by conflict-oriented interaction, due to the vested interests of the global actors: for example, developing countries demand more effort from developed countries to resolve their local issues, as they believe that climate change is caused by the Western world's rapid industrial growth. For the communication and implementation of the global policy and procedures at the local level, global actors are in need of global-to-local interaction. This leads to another phase: the global-to-local (globo-local) digital relational loop of interconnectivity.

In this phase, global actors collaborate with local actors for the development and implementation of global policies on climate change at the

local level. For example, what might be called 'material interaction', where international bodies like the UN and sometimes developed countries release funds as well as technology (i.e. sensors, pollution detectors, etc.) to the governments of developing countries to devise climate change policies and their effective implementation. Apart from this, immaterial interactions also emerge between global and local actors, whereby climate change knowledge and its solutions (e.g. clean development mechanisms) are transferred to local people. The temporal phase comes to an end at the loco-digital scale of interconnectivity, where all global policies and procedures are implemented at the local level. In sum, both interactions and scales structure the cosmopolitan relational loops of interconnectivity, which map out supra- and sub-national issues, debates, policies and procedures related to the cosmopolitanized risk of climate change.

Diverting from research on media and climate change communication and the focus 'on media content only or isolate singular behaviours, texts, or discourses' (Cox 2015, p. 371) and building on the notion that climate change communication perceptions are 'entwined in material, political, and economic, as well as cultural and discursive processes' (Cox 2015, p. 272), the cosmopolitan relational loop(s) of interconnectivity could provide a framework for a transnational, trans-local and integrated approach that analyses complex nonlinear interrelationships among human, digital and technical actors at the physico-digital scales and which might conceptualize: (1) 'the extent, spread, and/or scope of ways' (Cox 2015, p. 372) of climate change communication and (2) the 'context, multiplicity of sources… interrelationships, and processes' (Cox 2015, p. 372) influencing climate change communication and also (3) the flows of climate change information, including complex narratives and discourses for in-depth knowledge of the cosmopolitan scale of climate change communication flows.

Cosmopolitan Relational Loops: Epistemology of Climate Change Communication

Climate change news production is an important site for media researchers as it reveals hidden realities and 'behind the scene' complexities involved in the making of news. Knowledge of this kind helps us to analyse the role of news media in the construction and communication of the cosmopolitan risk of climate change. Today's advancements in

information and communication technologies refine the processes of news production, from a simple process involving human actors within geographical boundaries into a complex process involving dynamic, nonlinear and unpredictable interactions among human, technical and digital actors, between local and global places and old and new media spaces. On the contrary, media research is still eclipsed by the 'first wave of ethnographic studies' (Cottle 2009), which conceptualizes climate change news production through the theoretical lens of political economy, organizational sociology and cultural framing that are derived from the national framework; even their generalization is limited to the national boundaries.

Furthermore, it under-theorizes the construction of climate change news by adhering to the theoretical divide of local versus global media and old versus new media. As has been addressed by interviewed journalists in terms of political, economical, social, cultural, scientific and media interconnectivity and interdependency across multiple scales results in news production as a cosmopolitan process which influences the final construction of news not only in Western world regions but also in developing regions, such as Pakistan. Understanding such a complex intertwined reflexive process of climate change news production, a framework is needed that could theoretically map and empirically explore climate change news production and also includes journalistic practice in developing countries (Tolan 2007; Billett 2009; Boykoff 2010a, b; Schäfer and Schlichting 2014).

In social sciences and political theory, the issues of 'complex global interactions' (Lenschow et al. 2016, p. 34), 'global interdependences' (Lenschow et al. 2016, p. 34) and 'global interconnectedness' (McGrew 1997; Held et al. 1999) are legitimized via alternative approaches such as 'transnational governance' (Held et al. 1999); 'multilevel analysis' (Hooghe and Marks 2003); 'telecoupling' (Kissinger and Rees 2010; Liu et al. 2013, 2015); 'polycentricity' (Lenschow et al. 2016); and global networks (Castells 2009) to assess formations of global interconnectivity.

To bridge this gap, we suggest the 'cosmopolitan actoral relational loop' approach. According to this framework, climate change news production involves five phases of news production, i.e. (1) idea generation, (2) development, (3) verification, (4) composition and (5) communication. Each phase is characterized by its respective actoral relational loops that complete the phase and originates new actoral loops for the following phase.

The findings of the study indicate that the first relational loop is responsible for the idea-generation phase of the climate change news story production. An idea-generation relational loop is comprised of all the different environmental, individual, public, news, organizational, institutional, digital and technical, and event-oriented interactions that give input to a journalist for the idea of a story. Each idea initiates a chain of interactions for the development of the story. This leads to the verification relational loop, which is accountable for the development of the news story.

The second phase is the development of the climate change news story. To achieve this, journalists rely upon the 'headway' relational loop. This loop is itself comprised of sub-loops, i.e. an access-interactive loop and an information-seeking loop. In the access loop, local journalists are engaged in physical and digital interactions to approach glocal actors. In the information-seeking loop, journalists are involved in human (individual and institutional), technical (documents) and digital (online media and Web 3.0) interactions for the procurement of the required information.

The third phase of news construction is the authentication of the information acquired from different climate change actors. The verification relational loop helps journalists to check the accuracy of data (facts and figures) and information, so as to observe the journalistic ethics of objectivity. Once the loop activates, a journalist engages in multiple interactions that validate the truthfulness of the news story. These include human (individual, public and institutional), technical (official documents, scientific papers), digital (old and new stream media) and glocal interactions (global and local). The greater the number of interactions, the higher the chance that the information is accurate. Like previous relational loops, this one is also terminated by a reflective interaction corroborating the truth of the information. However, this reflective interaction is being influenced by event-oriented interactions, institutional interactions, temporal and spatial interactions, and technological interactions.

The fourth phase of news generation is the final composition of the climate change news story. The structural (composition) relational loop assists the journalist in structuring the content and style of news reporting. Such relational loop includes individual, institutional, professional, physical, digital, technical and glocal interactions. Like the previous

loops, the structural/composition loop ends with a reflective interaction that determines the final make of the story.

The final phase of climate change news production is deciding the target public and communication of climate change information. The solution to this problem lies in the communicative relational loop, which is comprised of two parts: audience relational loop and disseminative relational loop. The audience relational loop is comprised of subjective, professional and organization interactions that help journalists to select the target audience (local, global or both). Conversely, the disseminative relational loop is composed of textual interactions, oral interactions, oral–visual interactions and oral–visual–textual interactions that determine the format and medium of the communication to the respective audience.

Thus, it can be argued that climate change news production is neither in the local nor in the global scale, but rather in a cosmopolitan scale of news construction due to journalists' relational interconnectivity with local and global, physical and digital, and human and technical actors within and across the scales. Such cosmopolitan interconnectivity guides journalists to complete the five-phase process of climate change news production. During the first phase, the relational loop assists journalists to obtain ideas for their climate change news story. This is followed by the 'headway' (development) relational loop, which develops the story with the aid of its two sub-loops (access relational loop and informative relational loop). Once a sufficient amount of data and information to develop the story is assembled, the verification relational loop comes into practice and completes the third phase with the authentication of facts and figures. The composition relational loop finalizes the writing phase of the news story in the form of final copy. The communicative relational loop, with its audience relational loop and disseminative relational loop, ensures the message is delivered to the audience and terminates as soon as this goal is reached. Thus, it may be argued that the cosmopolitan nature of actoral relational loops assists journalists to produce climate change news stories at the local scale and disseminate them to the other relational scales in the overall cosmopolitan scale of climate change communicative flows (the local, global, digital, loco-digital, globo-digital and gloco-digital arenas). Here, these stories are fed, consumed or processed and initiate a chain of multiple actoral interactions (actoral relational loops) across these scales.

ACTORAL RELATIONAL LOOPS: TOWARDS A METHODOLOGY OF COSMOPOLITAN CLIMATE CHANGE MEDIA RESEARCH

A key challenge for the climate change media field is the development of an appropriate methodology in relation to a 'complex media landscape' (Anderson 2015b). In fact, the traditional approach of methodological nationalism is the most common methodology in media and social science research to explore the different dimensions of the cosmopolitan risk of climate change. It is considered inappropriate by authors, such as Hansen 2011; Volkmer 2012; Cottle 2013; Berglez and Olausson 2014a, b; Hansen and Cox 2015 who have emphasized the need of alternative methodologies such as 'social network analysis' (Anderson 2015b) to document the influence of nonlinear communicative flows on news production and representation, and its social and political implications (Hansen 2015a, b).

Conversely, the findings of this study suggest actoral relational loops as an alternative methodology to conduct cosmopolitan media research on climate change risk. Such an approach takes 'interaction', rather than nation or individual, as unit of analysis to seek the truth about cosmopolitan risks of climate change.

In fact, it is based on the supposition that the cosmopolitan reality of climate change is the result of complex, dynamic interactions that are not bound by time or space and take place between and across different scales. Without analysing these interactions, cosmopolitan reality cannot be constructed and cosmopolitan phenomena cannot be explicated. Furthermore, this approach includes both subjective and objective interactions. Unlike actoral and relational approaches, this approach reduces social phenomena in terms of interactions, which explain both the structure and the processes of the cosmopolitan risk of climate change. In other words, an explanation of the cosmopolitan risk of climate change demands our attention towards actoral interactions at different relational scales who are directly or indirectly involved in the construction of cosmopolitan reality of climate change, so the appropriate methodology to study the cosmopolitan risk of climate change is actoral relational interactivism. Furthermore, if we are truly interested to conduct media research on climate change in the context of cosmopolitanism, we are in need of units of analyses that are sub- and supra-national in nature, which is a central feature of the 'actoral relational interactivism' approach.

Building upon social network analysis (Latour 1996, 2005; Knoke et al. 2008; Scott 2013), we have devised an alternative methodology—actoral relational loop analysis—to study the ways of construction of the cosmopolitan risk of climate change across different sub- and supra-national scales. This methodology has the following advantages: first, actoral relational loops analyse interactions rather than social relations, which are studied by the social network analysis approach. Relationships are built by recurrent interactions; without interactions there is no relationship, and therefore, the fundamental unit of analysis should be interaction. Second, social network analysis is being criticized for its focus on the structure rather than the social relationships (Edwards 2010), while the actoral relational loop approach analyses both structure (different relational scales) and processes (actoral interactions). In other words, it explores how different multiple actoral interactions form different relational scales and how relational scales in turn generate more actoral interactions. Third, unlike SNA, which studies only flows stemming out of relationships, actoral relational loop analysis examines the communicative flows in the context of interactions. Finally, in opposition to SNA, actoral relational loop analysis facilitates both quantitative and qualitative approaches. Qualitative approaches explore the nature, origin, content, context and changing states of interactions, while quantitative methodologies quantify the magnitude and frequency of interactions in terms of their presence or absence, strength and forms. This is critical when assessing the production, construction, negotiation, contestation and resolution of cosmopolitan climate change communicative flows on a macro-scale and micro-scale, such as the local news production process and its representation and reception by the audience. Thus, the actoral relational loop methodology encompasses both qualitative and quantitative approaches to analyse the macro- and micro-relational scales of cosmopolitan risk of climate change.

Limitations and Wider Future Implications of the Study

On the surface level, the scope of this study is limited to the Pakistani context, a less explored country in the domain of mediated climate change communication; however, it can be argued that the implications of the study are wider, for three main reasons. The first one

is that Pakistan is a glocal site, because of large-scale activities of local and global actors of climate change linking to globalized politics of climate change. The second reason is the emergence of a glocal media sphere in Pakistan, which interlinks local, regional, national and global media on the one hand and shows the convergence of both old and new media on the other, as well as demonstrating the transnational and trans-local flow of climate change news across different media outlets facilitated by the information and communication technologies. Finally, Pakistan falls into the category of a 'developing' country, so a framework developed in the Pakistani context might be generalized for other developing countries of the South Asian region. The non-Western countries' context generalizes the findings of the study for developing regions. Thus, this approach provides a much-needed theoretical lens to conceptualize supra-national, sub-national and in-between debates of media and climate change communication.

Notably, the study has wider future implications for mediated climate change communication as it knits together three strands of media research—production, content and communication—via an integrative approach of 'cosmopolitan relational loops' of interconnectivity that unfolds a systemic analysis of multiplex, nonlinear, dynamic, transnational and trans-local actoral interactions between climate change actors who shape and influence the news production process of climate change. Thus, it can provide a fresh outlook on contextual influences like media–source relationships, i.e. the 'strategic and tactical action of news sources (e.g. scientists, NGOs and policymakers)' (Anderson 2015a, p. 381) for gaining media attention and coverage, including the framing and counter-framing of climate change issues, establishing the legitimacy and credibility of their claims, launching public relations campaigns, controlling media power to prevent 'issues or competitor sources from gaining media publicity' (Hansen 2015a, p. 386) and their use of visuals 'to bolster and privilege particular ideological views and perspectives on climate change over others' (Hansen 2015a, p. 88). Apart from this, the model can also provide insight into 'news management strategies, journalistic conventions and practices, format constraints, and media organizational arrangements' (Hansen 2015a, p. 388) that all impinge upon mediated climate change communication.

A second area where the cosmopolitan relational loop of journalistic interconnectivity model can be of benefit to global media research on

climate change risk are content studies. The existing literature on contemporary global news media representation indicate the frequent ups and downs of climate change issues in news media from the 1960s until 2010 (Boykoff 2008a, b, c; Hansen 2010; Hansen and Cox 2015). The most used framework to explain the phenomena is the issue-attention-cycle model, which is national in its outlook. According to the model, climate change issues generally lose out when competing for space against economic news and news on war and armed conflicts in times of crisis (Djerf-pierre 2012a, p. 499). For instance, a decrease in media coverage is observed during the Gulf War crisis and 9/11 events (Hansen 2015a, b). However, recent studies document the upward trend in media coverage of climate change issues over the last 15 years (Schmidt et al. 2013). A few studies attribute this rise in climate change news coverage to the institutionalization of climate change beats (Djerf-pierre 2012b; Hansen 2015b) in media houses and global events like natural disasters (tsunamis, hurricane Katrina), international conferences and summits on climate change (Bali, Copenhagen), the Climategate scandal and NGOs green activities. In fact, existing research rarely considers the density formations in which media climate change representations are derived through complex and nonlinear interactions between scientists, policy actors and the public, within and beyond the geographical borders and over the digital networks that are often mediated by a journalist's news stories (Carvalho and Burgess 2005).

This gap might be bridged by the suggested cosmopolitan relational loop approach which addresses dense transnational 'scalar' interactions and considers climate change news production as the result of multiple actoral relational loops of journalists with climate change actors (human, technical and digital), within and across physico-digital relational scales. For instance, the current increase in media coverage of climate change issues can be attributed to intense human, digital and technical interactions of journalists with climate change actors on all scales, from local to global. In other words, the more cosmopolitan actoral relational loops take place, the more will the media cover climate change issues. Conversely, a drop in coverage can be associated with the absence or weak form of these multiple actoral interactions.

Additionally, the cosmopolitan relational loop of journalistic interconnectivity model can provide further insight in the field of reception studies. These map the role of media and communication processes in

shaping public and political perception of climate change and their views, behaviour and decisions regarding the adoption of climate change mitigation and adaptation measures (Hansen and Cox 2015, p. 7). The rise of digital media (social media, blogosphere and online media) has changed the mediascape and has a strong impact on the masses beyond any national boundaries. However, the media is in turn influenced by a number of human, technical and digital actors that shape the content of news. In such as scenario, we suggest an integral, transnational and interdisciplinary framework to conceptualize the impact of multiple sources of information (human, technical and digital) on the audience and news media. It also theorizes nonlinear interactions between media of all types, from local, national, regional and global to online and social media, and their influence on audiences on all scales. This will help to reconceptualize the decade-long debate in media reception studies of climate change about who sets the agenda (the media or the public), how the agenda is set, who frames climate change issues (the media or climate change actors), how the framing is set and how digital media sets the public agenda or vice-versa. Lastly, it will help explore the factors behind higher and lower level of public awareness and its variations across the globe. By adopting the cosmopolitan relational loop framework, research studies could explore public knowledge about climate change, their perception of climate change, and the rise and fall of public awareness about climate change. In sum, the more we analyse the cosmopolitan relational loops between journalists and climate change actors (human, technical, digital) over supra- and sub-national scales, we conceptually escape from national bounded approaches and achieve the goal of cosmopolitan media research by integrating climate change news production, representation and reception studies.

In conclusion, the study is an attempt to develop a transnational, interdisciplinary, empirical and practical theoretical framework as a methodology to address the different dimensions of the cosmopolitan risk of climate change in the domain of social theory, and specifically in the media context. Ontologically, it constructs climate change as a cosmopolitan risk because of the similarities of climate change events, issues, debates and measures across the world, and it argues that it is a by-product of complex, nonlinear and dynamic actoral interactions in human, technological and digital networks across physico-digital relational scales, both sub-national and supra-national. Thus, it bridges the

ontological and epistemological differences between the various social science fields (and specifically the dualism of old and new media on the one hand, and of trans-local and supra-national media on the other), on the basis of their common ground, i.e. the multiple actoral interactions that are cosmopolitan in nature and range from human to technical, physical to digital and local to global. In short, it conceptualizes different dimensions of the cosmopolitan risk, i.e. its production, construction, negotiation, contestation, resolution and communication across different relational scales, and this provides an insight into the nature of cosmopolitan politics of climate change. Epistemologically, it theorizes the cosmopolitan nature of climate change news production by arguing that the journalistic actoral relational loops between climate change actors (human, technical, digital, local and global) of cosmopolitan nature shape news production and influence their content, and this altogether impacts the communicative interaction of media with the public. It might serve as a framework to study 'universalism and particularism' in terms of construction of climate change risks in local, national, regional and international media, old versus new stream media, Eastern versus Western media, and across all forms of communicative interactions among them that shape inter-media relationships and their construction of the cosmopolitan reality of climate change. From a methodological point of view, it takes actoral interactionism as the unit of analysis and explores different types (subjective/objective, individual/institutional, physical/digital, human/technical and local/global) and different forms of interaction (political, social, material, cultural, scientific and media), which shape the cultural politics of these supra-national and sub-national scales of interconnectivity and the communicative flows among these relational scales. Furthermore, it gives empirical ground to media and social science researchers to map nonlinear and dynamic actoral interactions in the field of cosmopolitan climate change research with a qualitative and quantitative approach. In this way, it provides an inside view of processes and an outside view of the cosmopolitan risk of climate change. Lastly, it suggests the model of cosmopolitan relational loops of journalistic interconnectivity as a practical solution to improve the communicative relationships of news media with citizens, policymakers and scientists by enhancing the quality and increasing the quantity of climate change news coverage and thus might contribute towards the global efforts to save the Earth's future.

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