

# MASS-MEDIA COVERAGE OF CLIMATE CHANGE IN PERU: FRAMING AND THE ROLE OF FOREIGN VOICES

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## *Abstract*

*Media coverage of climate change has been an area of continued research during the last few years, mostly with a focus on developed countries. This study attempts to contribute to this body of work by analyzing the coverage in a developing country. The study presents a content analysis of newspaper coverage of climate change in Peru through the study of frames, geographical focus, and climate change strategies (mitigation/adaptation). Additionally, the role of foreign voices is assessed by comparing news coverage by Peruvian reporters with the news coverage by wire services and by determining the types of sources present in the articles. Results show a prevalence of an effects frame, followed by a politics frame. Also, the study found a significant number of stories originating from wire services. In general, coverage prioritizes mitigation strategies and policies while providing limited attention to adaptation, which can be inadequate for a highly vulnerable country.*

***Keywords: Climate Change, Content Analysis, Media, Newspapers, Peru***

Developing nations are the most vulnerable to the effects of climate change. The ecological, economic, and human effects in Peru and most Latin American countries have been widely reported. Decreases in commercial fish catches in both the Atlantic and the Pacific oceans (Chávez, Ryan, Lluch-Cota, & Ñiquen, 2003), effects on biodiversity in the Amazon rainforest (Laurance, 1998; Miles, Grainger, & Phillips, 2004), melting of tropical glaciers (Vuille, Bradley, Werner, & Keimig, 2003; Vuille et al., 2008) that have an effect on water availability (Barnett, Adam, & Lettenmaier, 2005), decreases in agriculture outputs (Jones & Thornton, 2003), and impacts on human populations via the spread of vector-borne diseases such as malaria (Githeko, Lindsay, Confalonieri, & Patz, 2000) are just some of the main problems that can result from

climate change.

Despite these impacts and the scientific evidence that ascribes most of the responsibility to humans (IPCC, 2007), policy action aimed at mitigating climate change and adapting to its effects have been considered complex to say the least (Selin & VanDeveer, 2009). Part of the challenge is the fluctuating attention by politicians, the public, and the media. Downs (1972) talks about the cyclical nature of these problems, and Hilgartner and Bosk (1988) point to the limited carrying capacity of different policy arenas. Climate change as a policy issue has entered and exited these policy arenas during the last few decades due to factors such as scientific evidence, focusing events (e.g. Hurricane Katrina), and symbolic representations (Kingdon, 2003). Recently, the issue has had to compete for attention with other salient topics such as the world's economic crises and wars in the Middle East, among others. According to a Gallup poll, less than 2% of the U. S. American public mentioned global warming as the most important problem facing the nation (Newport, 2010). Policymakers tend to follow the national mood when prioritizing policy issues (Kingdon, 2003), which partly explains the current state of policy gridlock at the federal level in the United States.

The influence of U. S. policy actions on other countries is clear. Moreover, the U. S. can be considered a hub for information flow. The information disseminated through formal and informal channels can have an effect on public opinion and on policy responses. In the case of climate change, research has shown that the mass media represent the main sources of information for most individuals (Stamm, Clark, & Eblacas, 2000; Wilson, 1995, 2000). Similarly, agenda-setting (see Pralle, 2009) and media effects studies (see Sampei & Aoyagi-Usui, 2008) document and discuss the role of the media in climate change policy discussions. It is then no surprise that the scholarship on climate change communication has gained momentum during recent years. Studies on public perceptions, media coverage, and communication strategies are found across disciplines. However, as with most areas of science and environmental communication, there is a strong focus on developed countries. This apparent bias is not necessarily a function of predetermined neglect for developing nations, but more a response to factors such as data availability. However, researchers are starting to look into media coverage of climate change in developing countries. Previous studies in India (Billett, 2010; Boykoff, 2010), Mexico (Gordon, Deines, & Havice, 2010), and Peru (Takahashi, 2011) demonstrate this trend.

The present study attempts to contribute to this growing body of work on climate change communication by focusing and expanding previous research in Peru. The methodological approach borrows from previous studies, and incorporates new approaches relevant to the specific case study. This research is concerned with assessing the coverage of climate change and the prevalence of foreign voices in such coverage. This is done through a content analysis of newspaper articles that considers their main frames, sources, and geographical focus, among other variables explained in the methods section. The next section briefly discusses the relevant literature on the area of climate change and the media as well as the literature on the role of news agencies.

### *Climate Change in the Media*

Anderson (2009) provides a thorough review of the literature on media coverage of climate change, and suggests that the media in developing nations have provided limited attention to the issue. Furthermore, Shanahan (2009) discusses some case studies in developing countries, and suggests that this coverage has also been limited and inadequate. Additionally, he argues that there has been a lack of research on the coverage in vulnerable countries. Similarly, both Gordon et al. (2010) and Takahashi (2011) argue that no other studies on Latin American media coverage

of climate change were found during their research on Mexico and Peru. These two studies presented methodological constraints in terms of data gathering due to the limited availability of articles in academic databases. The present study attempts to improve this data collection problem.

U. S.-based studies have employed media framing and issue attention cycle analysis (McComas & Shanahan, 1999; Trumbo, 1996). Some articles have discussed the problems in coverage in relationship to journalistic practices. For example, Boykoff and Boykoff analyzed the problems of the norm of balanced reporting (Boykoff, 2008a; Boykoff & Boykoff, 2004, 2007). Similarly, Antilla (2005, 2010) discussed issues of reporting and self-censorship in U. S. press coverage; and Wilkins (1993) identified the main values that drive reporting. Using a different theoretical approach, Kim (2011) analyzed U. S. media perception of climate change using the hostile media perception concept, and found that partisanship had an effect in perceptual differences when using the same news story. Nissani (1999) also compared U. S. media and scientific discourses, and found that the media present shallow reporting and a pro-corporate bias towards environmental issues. Recently, Sonnet (2010) applied the theory of symbolic capital and correspondence analysis to understand the differences between scientific and political discourses in a variety of periodicals from political, scientific, environmental, and industry arenas in the U. S. Neff, Chan, and Smith (2009) found that the topic of food systems and its contribution to climate change has not been a major focus of attention in the U. S. elite media despite the solid scientific evidence of its importance.

Studies in the United Kingdom are also common, focusing on dominant discourses (Doulton & Brown, 2009); misrepresentations of anthropogenic causes in the tabloids (Boykoff, 2008b); political and ideological influence in reporting (Carvalho, 2007; Carvalho & Burgess, 2005); and more recently, on the use of religious metaphors to denigrate anthropogenic climate change (Woods, Fernández, & Coen, forthcoming). Research has also tackled the connection between climate change and weather events. For example, Gavin, Leonard-Milsom, and Montgomery (forthcoming) discuss the coverage of flooding in relation to climate change in the British press, similar to the analysis by Ungar (1999) of the relationship between coverage of extreme weather events and climate change on U. S. television networks. On the other hand, Hulme (2009) provides an event-centered analysis in the U. K. following the release of the fourth IPCC report. The study reports that the media relied mostly on alarmist and fatalistic discourses.

Beyond the U. S. and U. K., other developed nations have also been the focus of media analysis. Analyses similar to the ones presented above have been conducted in Portugal (Carvalho & Pereira, 2008), Finland (Lyytimäki & Tapio, 2009), and Australia (McManus, 2000). In Sweden, Olausson (2009) applied a qualitative critical discourse analysis (CDA) to focus on the variations in the use of a mitigation frame in comparison to an adaptation frame. The role of emotional representations of climate change in a news program television and a tabloid in Swedish media was also analyzed by Höjjer (2010). Finally, Sampei and Aoyagi-Usui (2008) discussed the influence of newspaper coverage of climate change on public opinion in Japan.

In addition, some comparative studies across countries have been conducted. Brossard, Shanahan, and McComas (2004) compared the coverage between U. S. and French newspapers. Similarly, Dispensa and Brulle (2003) analyzed the newspaper coverage and scientific publications in the U. S., Finland, and New Zealand. New Zealand is also the focus of a study by Kenix (2008) that studied the coverage by alternative and mainstream media. The study found no major differences, suggesting that media ownership, organization-specific routines, and values did not have an effect on the coverage itself.

In summary, the study of mass media and climate change has expanded considerably

using a variety of methodological and conceptual approaches, mostly in developed nations. There are clear gaps that still need to be addressed in order to provide a better understanding of the role of the media on a broader scale.

### *The Role of International News Flow*

The prevalence of news information flows from news agencies to developing nations has been the focus of extensive scholarship in recent decades. This scholarship extends back to initial discussions about cultural imperialism that suggested that information from developed nations, mostly from the U. S., had a direct influence on cultures in developing nations. This thesis was widely debated and challenged by scholars who argued that new cultural identities are formed through resistance to and assimilation of the dominant culture. However, this appropriation was delimited by “first order” meanings, which retain certain traits of the dominant culture (Elteren, 2003).

Despite the debates surrounding cultural imperialism, the fact remains that the flow of information between countries is still widely unbalanced. Wu’s (1998) meta-analysis of the literature suggested that the determinants that influence international news flow and the overreporting about events and issues in developed nations around the world include national GNP, volume of trade, regionalism, population, geographic size, geographic proximity, political/economic interests of the host countries, “eliteness,” communication resources, and cultural affinity.

Boyd-Barrett (2000) considered the role of news agencies in constructing global and national identities, and provided a thorough summary of the scholarship on the type of coverage provided by news agencies. He suggested that:

*The content of the news tends to be about topics that privilege elite national institutions or players, or about their relationships at transnational levels, primarily within the spheres of politics, military affairs, business and economics, intergovernmental organizations, and sports.* (p. 310)

This dominant content focus has also become prevalent on the internet, a medium that was expected to democratize and decentralize news production (Paterson, 2005). Alleyne and Wagner (1993) surveyed the extent of influence of the main news agencies in the 1990s and their relationships with governments, arguing that the latter were not willing to let the agencies fail despite major financial constraints. This guaranteed their long term status as dominant news organizations, but also raised questions about their reliability as news sources.

The dominance of news agencies in the media landscape has several effects on framing of issues and eventually on people’s understandings. For example, Horvit (2006) analyzed the coverage of the U. S.-Iraq conflict in early 2003 from the perspective of both Western and non-Western news agencies. She found that there was a dramatic difference in the use of non-Western vs. Western news sources. Similarly, from a qualitative perspective, Rauch (2003) analyzed a G77 meeting in Cuba, comparing the coverage between a mainstream and an alternative news agency, AP and IPS. She found that “IPS coverage demonstrates decentralizing and de-Westernizing tendencies that are absent from the AP discourse” (p.100). AP covered the issue in a one-dimensional and “North-centric” perspective.

This discussion has also taken place within Latin American academic circles. In the 1970s, Córdova Claire (1976) critiqued the influence in Latin America of international wire services. He called for an Andean regional agency in order to counter the flagrant errors of international wire services and their influence on social and political affairs. That said, studies focusing on the Latin American press and the prominence of international news agencies have been scarce. On

the other hand, studies of Latin American news in developed nations' media have been relatively frequent (see Hester, 1971; Hester, 1974; Peterson, 1981).

In more recent research, Lozano (2000) conducted a content analysis of eight Latin American and two Spanish newspapers, and found that the dominance of foreign news was not as high as it was in the 1960s and 1970s, but was still largely dependent on a handful of wire services. Moreover, the regional coverage focusing on Latin America was not as positive as expected (Lozano, 2000). Sepúlveda Beltrán and Mayorga Rojel (2005) also discussed the role of news agencies, specially the Big Four (AP, UPI, REUTERS and AFP), as they account for approximately 70% of international news in Latin America. Sepúlveda Beltrán and Mayorga Rojel critiqued the role played by these news agencies in concentrating information flows, suggesting that they serve as a primary function of propagating the false image of a center (developed nations) to the periphery (developing nations).

Finally, specifically on the topic of climate change, Antilla (2005) concluded that the wire service community "is not only an essential but a dominant source of climate science news" (p. 350). This assertion served as a precursor to the present study, following one of the recommendations by Anderson (2009) in respect to future areas of research in climate change communication: "Future studies could also usefully examine the role of global news agencies/wire services since they have been shown to be an important source of information on climate science" (p. 176).

This review, along with the previous discussion on the state of research on climate change media coverage, serves as the justification for the present study of Peruvian media coverage, as well as the focus on information flows and foreign sources as they relate to the policy needs of Peru. Specifically, this study is guided by the following research questions: In what ways does the Peruvian press cover climate change? What role do the wire services play in such coverage?

## Methods

Dirikx and Gelders (2010) pointed out that most studies on media coverage of climate change have applied a critical discourse analysis (CDA) approach. They argued that although CDA provides a rich textured analysis of texts – something Carvalho (2007) and Anderson (2009) have advocated – the inductive nature of this method does not allow for major comparative efforts. The present study applied a content analysis that borrowed main variables and coding categories from previous studies to determine similarities in reporting. However, recognizing the presence of frames and discourses specific to the Peruvian media, additional coding categories salient to the data were also incorporated through an inductive process.

The archives of Peruvian newspapers are not easily accessible. Databases such as Lexis Nexis do not offer the same kind of access as they do to North American papers. However, the leading Peruvian newspaper, *El Comercio*, has a database of all major Peruvian newspapers (excluding sensationalist publications) in digital form since 2000 in its archival office in Lima. The newspapers cover a range of ideological positions, and include the following: *Correo*, *El Comercio*, *El Peruano* (official government newspaper), *Expreso*, *La Primera*, *La Razón*, *La República*, *Gestión*, *Ojo*, and *Peru21*. *El Comercio* is widely perceived as the most influential newspaper, and in terms of format, along with *El Peruano*, it is the only one that is not considered a tabloid (in terms of size). A search in these ten newspapers using the keywords "climate change," "global warming," "greenhouse effect," and "greenhouse gases" in the headline and the lead was conducted for the period January 2000 to December 2010. A total of 509 articles were retrieved. After a review of all articles to make sure they focused on climate change, a total of 459 were retained. Duplicate and irrelevant articles were discarded. Articles were then categorized by

format (opinion piece, editorial, or news article).

Similar to most studies in this area, the article was considered as the unit of analysis. The articles were first coded by their descriptive information, including the type of author (journalist, commentator, news agency, or unknown), and the origin of the author (Peruvian or foreign). Next, each article was coded based on the degree to which climate change was its focus, either primary or secondary. From the total sample, 409 were coded as primary. The analysis of all variables explained below was conducted only on the articles with a primary focus.

Entman (1993) defined framing as the selection of a perceived reality that is made more salient in a text. Based on this conceptualization, this study followed the work of McComas and Shanahan (1999), Brossard et al. (2004), and Boykoff (2008b). From the latter, the two-tier framing scheme was adopted. In the present study, based on the inductive review of some articles, the main frames and sub-frames were modified accordingly to better fit and more adequately capture the reporting from the Peruvian media. This process produced five main frames: “effects,” “opportunities,” “politics,” “society,” and “science.” Additionally, each frame contained sub-themes that were coded either as present or absent. Under this structure, all sub themes under a

Table 1 – Frames and sub-frames

Main frame	Sub-themes	Definition
Effects	Ecological effects	Climate change has an impact on ecosystems, biodiversity, or extreme weather events (e.g. heat waves, droughts, floods).
	Human effects	Climate change has an impact on the health of human populations, or is responsible for deaths, conflicts, or migration.
	Economic effects	Climate change has an impact on economies, industries’ revenues, etc. Also includes the costs associated to mitigate and/or adapt to climate change (e.g. cost of new infrastructure or damage to existing infrastructure, which does not reference direct human effects). Reference to commodities/products (e.g. mangos, bananas, etc.) are also included.
Opportunities	Technological solutions	New technologies and applied science developed to solve an aspect of climate change (e.g. renewable energy, electric cars, geoengineering, etc.).
	Corporate initiatives	Initiatives of businesses to address some aspect of climate change. Include actions within corporations, and initiatives promoting actions within societies or ecosystems.
Politics	Policies	Policy options at any level of government (local, regional, and national), including international agreements. This could include cap and trade, clean development mechanism, carbon trading, energy taxes, etc.
	Political discussions	Agreements or disagreements about policy options based on political interests (focuses on game-framing instead of issue-framing). Also includes science/policy controversies (e.g. “climategate”).
Society	Popular culture	Focus on celebrities, movies, books, and any other popular culture artifacts.
	Civil society initiatives	Issues about justice, risk, public understanding of climate change, knowledge (e.g. poll results, consumer reports), etc. Social mobilizations, education initiatives, and individual and societal level actions to mitigate or adapt to climate change are also included (e.g. earth hour).
Science	Basic science	Describes basic concepts and ideas related to climate change science, such as definition of the greenhouse effect, greenhouse gases, sources of pollution, ecological sinks, historical trends, etc.
	News studies/discoveries	New studies or upcoming studies revealing a new aspect of climate change or its related impacts.

dominant frame could be coded as present. Table 1 presents this sub-division.

The study used the variable “cause” to determine the level of debate regarding the establishment of climate change as a problem, and the extent to which it can be attributed to anthropogenic sources. Codes used include “anthropogenic source,” “natural source,” “both anthropogenic and natural,” “climate change not happening,” and “no mention.” Additionally, articles were coded by the overall tone of the article towards climate change (“negative,” “positive,” “ambiguous,” or “neutral”), and by the presence or absence of references to mitigation and/or adaptation measures. It was expected that coverage would place a stronger focus on mitigation, following what Anderson (2009) stated: “So far, the emphasis within news media coverage has tended to be on mitigation rather than adaptation” (p. 178).

This study also provides a geographical focus not applied in previous studies. This “geographic focus” variable is also related to the variable mitigation/adaptation, as it captures the relevance of the coverage to the needs of the country. In this respect, the articles were coded using three codes, “strong focus on Peru,” “moderate focus on Peru,” and “no focus on Peru.” Additionally, the articles were coded using a “scale” variable that included the presence or absence of the codes “national,” “regional/state,” and “local.” Although most visible discussions have taken place at the international and national levels (Hempel, 2005), initiatives in the U. S., as reflected by the C40 Cities initiative, show that significant actions are also taking place at the local level (C40 Cities, n.d.).

Finally, all sources, directly quoted or paraphrased, were coded in general categories. Sources were coded as being either Peruvian or foreign, and included “NGO,” “Industry,” “Researcher/Expert,” “Civil society,” “Celebrity,” “National government,” “Regional government,” “Local government,” “Multi-state organization” (e.g. U.N., European Union, World Bank), and “Other.”

Two coders coded 10% (n=40) of the articles to assess inter-coder reliability. Krippendorff’s (2004) alpha levels for the main variables were calculated and are reported in Table 2. Reliability scores for some of the variables were lower than expected, therefore disagreements were discussed among the coders to determine procedural problems and improve

Table 2 – Inter-coder reliability

<i>Variable</i>	<i>Krippendorff's alpha</i>
Main frame	0.82
Cause	0.46
Geography	0.76
Mitigation	0.96
Adaptation	0.37

coding. After this process, one of the coders coded the rest of the articles.

Significance tests were conducted across the variables and the different categories of authors and origin of the author. From the sample, 109 articles did not include a byline and were coded as “unknown” in terms of authorship and origin of the author. For comparison purposes, unknown-authored articles were not used in tests including the variables “authorship,” and “origin of author.”

## Results

Because of the uneven distribution of articles across newspapers, articles not published in *El Comercio* were all recoded in an “others” category for analysis purposes. Based on this categorization, 317 articles (77.5%) were published in *El Comercio*, and 92 (22.5%) in all other

newspapers. Although the archival staff at *El Comercio* argued that all articles from every newspaper are indexed, this disproportion could be due to a difference in the indexing between articles in *El Comercio* and those from all other newspapers. The distribution could also be explained based on the availability of space in *El Comercio* (full newspaper format versus tabloid format from all the others except for *El Peruano*), and/or that *El Comercio* places a relatively higher importance to the issue of climate change.

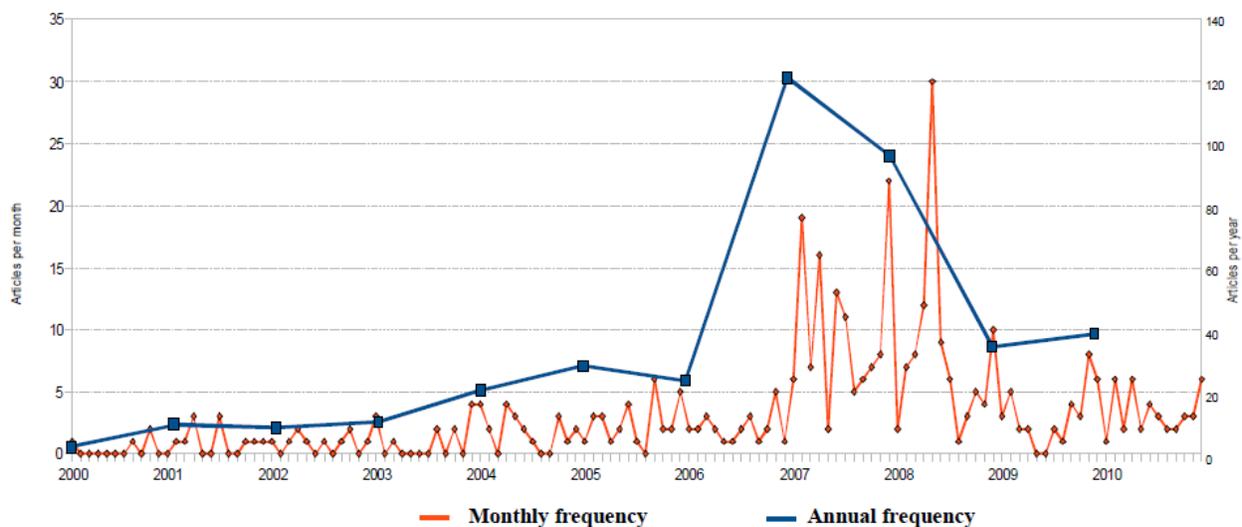
## Frequency of the Coverage

The frequency of the coverage by year and month from 2000 to 2010 is presented in Figure 1. Climate change appears to have received limited media attention, accompanied by some punctuations. After limited coverage from 2000 to 2006, the issue received intense coverage in 2007 and 2008, and then decreased in intensity in 2009 and 2010. It is evident that the years 2007 and 2008 contribute disproportionately to the data sample (29% and 26% respectively). This trend loosely reflects the coverage found in previous studies (Boykoff, 2010). However, recent tracking of media coverage worldwide shows that in 2009, coverage spiked, mostly explained by the anticipation of the December 2009 Copenhagen climate summit (Boykoff & Mansfield, 2011).

From the data presented here, the reasons for this difference is unclear, but some speculative arguments might help to explain. In 2008, Peru hosted the Latin America and European Union summit, where the two main topics were poverty and climate change. This is evident by the number of articles published in May 2008, the month the summit took place, which is the highest in the dataset ( $n=30$ ). During the summit, Peruvian President Alan García also announced the creation of the new Ministry of the Environment, which might also explain the amount of coverage. December 2007 is the second highest spike ( $n=23$ ), which coincided with the 2007 COP-13 meeting held in Bali. February and April of 2007 also presented interesting spikes, which coincided with the release of reports by the IPCC that stated that climate change is very likely to be human induced (IPCC, 2007).

Despite the increasing trend building towards 2007-2008 and then the drop for the last two years, it is surprising to see the dramatic drops in coverage after the biggest peaks. Immediately after the peaks of December 2007 and May 2008, the coverage dropped to pre-2007 average levels. This could suggest that coverage was event driven, similar to the results reported in Mexico (Gordon, et al., 2010), although the extent to which competing issues – such as the economic world crisis – affected the coverage is unknown.

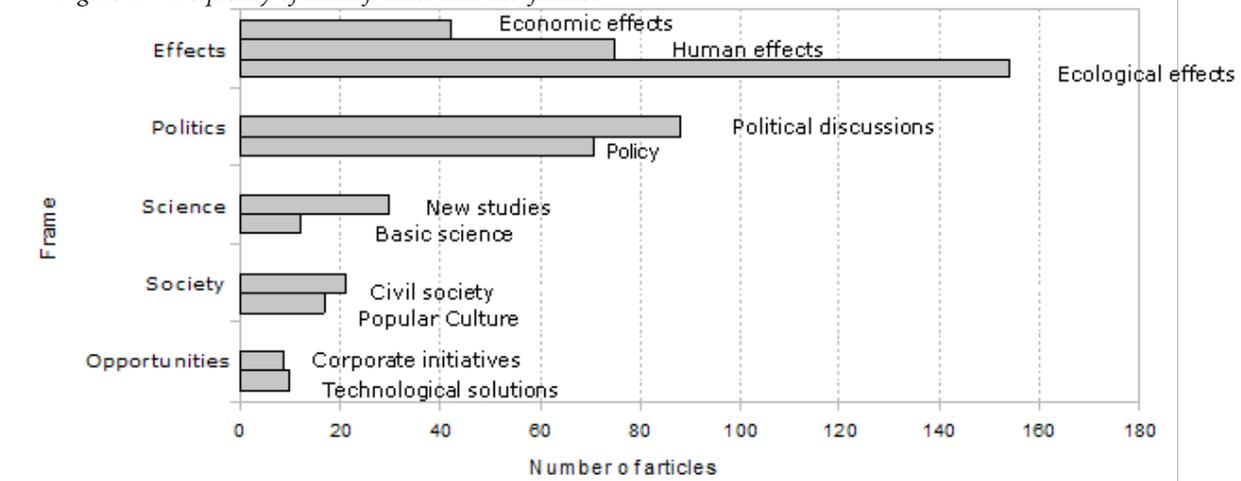
Figure 1 – Frequency of coverage 2000-2010 by month and year



## Framing the Issue

The distribution of main frames and sub-frames is presented in Figure 2. The “effects” frame was clearly the most prominent one, with a presence in almost half of the sample (46.7%). In regards to the sub-frames, the “ecological effects” frame was present more than twice as often as the “human effects,” and more than three times as much as the “economic effects” frame.

Figure 2 – Frequency of main frames and sub-frames



A dominant theme frequently discussed within the “ecological frame” refers to the melting of tropical glaciers in the Andes mountains. Headlines such as “Fate of Peruvian glaciers at play in Poznan summit” (La suerte, 2008), “Peruvian Andes lost 22% of their glaciers” (Andes del Perú, 2007) and “Say goodbye to the glaciers” (Díganle adiós, 2007) exemplify the fatalistic view of a problem that is portrayed as inevitable and out of human control. An important number of articles using a human effects sub-frame (n=75) discussed issues of water access, vector-borne diseases, food security, migration due to sea level rise, among other known effects. Most articles broadly discussed the effects on vulnerable, rural, and poor populations, but in few cases, personified the threat. The second most used frame was the “politics frame.” In this respect, the sub-frames “political discussions” and “policies” were similarly used. Articles with a science frame discussing new studies mostly came from wire services. Examples include: “Millions of tonnes of methane emerge in the Arctic” (Salen a superficie millones, 2008) and “Global warming advanced more than predicted” (Calentamiento global, 2010). This frame was found mostly in articles not focusing on Peru.

Significance tests were conducted between the “framing” variable and the variables “authorship,” “origin of author,” “geography,” and “strategy” (see Table 3). The authorship variable showed that articles authored by journalists and wire services have a similar use of frames, while commentators tended to use a “politics” frame more often. In terms of origin of the author, there was no significant difference between the use of frames by Peruvian and foreign authors. Although it is not possible to provide evidence from the data presented, it could be that Peruvian journalists and commentators were influenced by the information coming from news agencies. Articles with a strong focus on Peru tended to use an “effects” frame mostly, while articles with a moderate focus or no focus on Peru used the “effects” and “politics” frame more evenly. The analysis also revealed a difference between the uses of frames when discussing mitigation and/or adaptation strategies. While mitigation was mostly discussed in a politics context, adaptation was discussed within an effects frame.

Table 3 – Crosstab frame

		Effects	Opportunities	Politics	Science	Society
Authorship	Commentator	6 (18%)	1 (3%)	24 (73%)	2 (6%)	0
	Journalist	66 (51%)	10 (8%)	29 (22%)	13 (10%)	11 (9%)
	Wire service	63 (46%)	2 (1%)	41 (30%)	20 (15%)	11 (8%)
	$(\chi^2 = 47.222, df=12, p=0.000)$					
Origin author	Foreign	69 (44%)	8 (5%)	50 (32%)	20 (13%)	11 (7%)
	Peruvian	66 (47%)	5 (4%)	44 (31%)	15 (11%)	11 (8%)
	$(\chi^2 = 8.514, df=8, p=0.385)$					
Geography	No_Peru	80 (38%)	13 (6%)	69 (33%)	31 (15%)	19 (9%)
	Peru_moderate	33 (49%)	2 (3%)	23 (34%)	5 (7%)	4 (6%)
	Peru_strong	78 (60%)	3(2%)	29 (22%)	6 (5%)	14 (11%)
	$(\chi^2 = 24.777, df=8, p=0.002)$					
Strategy	Mitigation	21 (17%)	16 (13%)	65 (53%)	7 (6%)	14 (11%)
	Adaptation	32 (65%)	1 (2%)	10 (20%)	3 (6%)	3 (6%)
	Both	15 (38%)	0	24 (60%)	1 (3%)	0

Articles coded as “unknown” in the variables authorship, origin of author, and “none” in the variable strategy are not included. All variables are statistically significant at  $p < 0.01$  except for origin of author.

As expected, a considerable number of articles came from wire services (approximately one third, all coded as foreign source). Another third was authored by journalists (90% Peruvian), approximately 8% was authored by a commentator (75% of which were Peruvian), while 27% had no author listed. Additionally, a t-test revealed a significant difference between the mean number of words used by journalists ( $M=821.72, SD=368.27$ ) and wire services ( $M=341.24, SD=209.32$ ) ( $F=43.46, p=0.000, t=13.18, df=264$ ).

Stories authored by wire services had very limited focus on Peru (91%), while stories authored by journalists had mostly either a moderate or strong focus on Peru (64% combined) ( $\chi^2 = 139.29, df=6, p=0.000$ ) (see Figure 3). In regards to the type of strategy discussed (mitigation and/or adaptation), figure 4 shows a significant difference ( $\chi^2 = 59.684, df=9, p < 0.01$ ) between articles authored by wire services, journalists, and commentators. Both wire services and journalists focused mostly on mitigation themes; however, journalists (which were mostly Peruvians), tended to discuss adaptation measures in higher proportions.

Figure 3 – Authorship and geographical focus

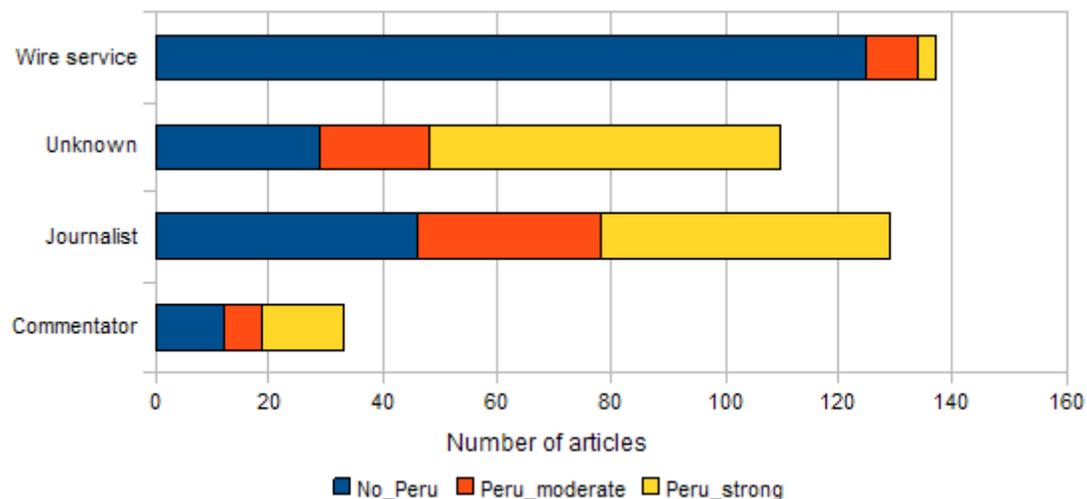
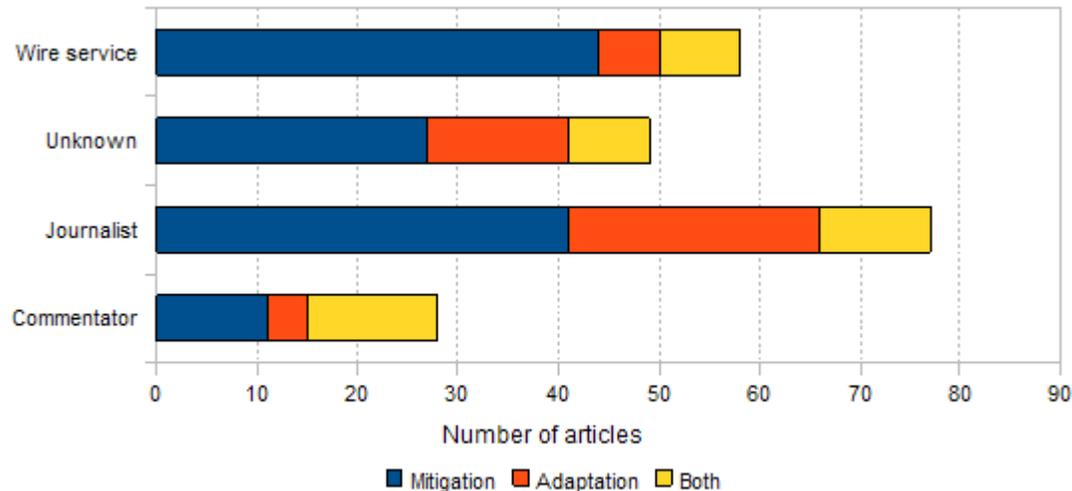


Figure 4 – Authorship and strategy



Half of the articles discussed the issue as a result mostly of human actions. The rest of the articles did not make an explicit mention or it was not possible to deduce a position, with less than 2% suggesting that climate change is only a natural problem, or that it is not happening at all. In terms of the tone, more than 80% of the articles presented climate change in negative terms (e.g. a threat, a problem, a costly issue, etc.). About 14% used a neutral tone, while only 2.4% used an ambiguous tone, and only one article discussed it in a positive light.

In terms of the geographical scale, a focus on a national scale was used in 57% of articles, 16% mentioned regional issues, while 20% discussed local features. After cross-tabulating with the variable “strategy,” it became clear that articles discussing mitigation actions did not usually do so at the national level. Although articles discussing adaptation tended to also discuss such issues mostly at a national level, there was a higher tendency to include the local and regional levels.

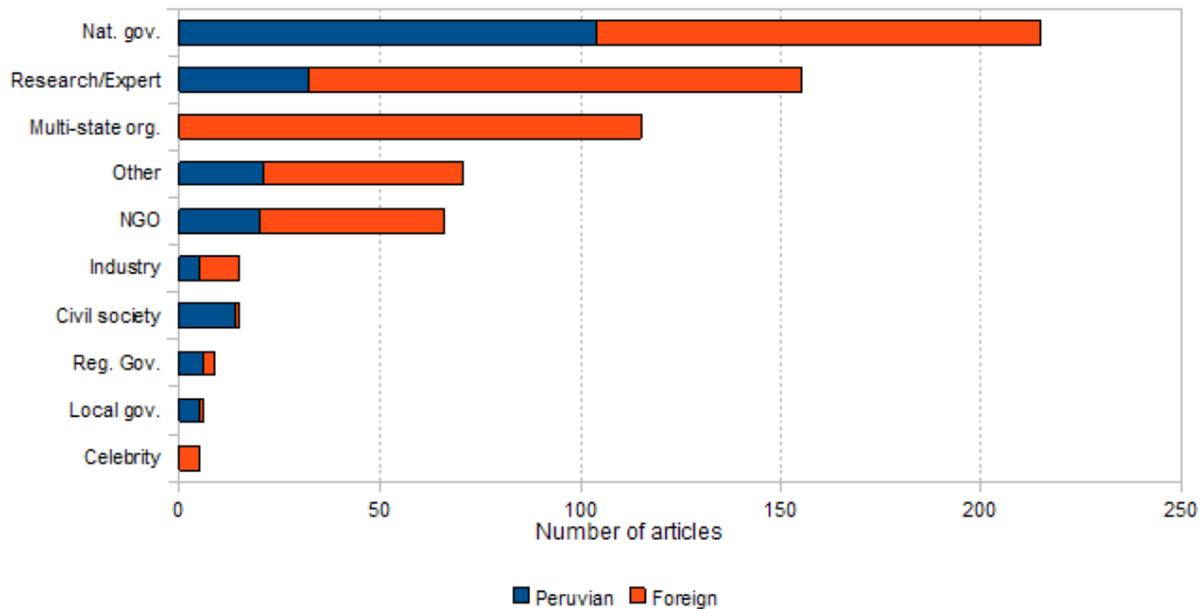
### Who Has Media Access?

Figure 5 presents the number of sources by origin (Peruvian or foreign). Consistent with previous studies, “national government” sources (32%) clearly dominated media coverage, with almost an equal split between Peruvian and foreign sources. “Researcher/expert” was the second most prominent source, with foreign sources accounting for almost 80%. These sources were mostly found within the “science” framed articles (55%, n=23), while none of the Peruvian sources were found in this type of article. Previous research shows that “reporters who primarily use scientists as sources and who work the environmental beat full-time have the most accurate climate change knowledge” (Wilson, 2000, p.1). Although the number of expert sources used by journalists is important, most of them are not considered climate experts, which can partly be explained by the lack of controversy regarding the existence of the problem, as has been the case in the U. S. (Boykoff & Boykoff, 2004).

In relationship to previous studies, there is a very limited use of “business” sources, which were highly prominent in the *New York Times* (Brossard, et al., 2004). In Peru, because of the low number of articles using the “opportunities” frame, it comes as no surprise that there was a low number of “industry” sources. Similarly, there was almost no presence of local and regional government voices or community sources. In this regard, articles with a strong focus on Peru were evenly distributed when applying the variable “scale” (national=66, regional=45, and local=53). This suggests that the coverage at the regional and local levels was not incorporating sources that

were representative of those areas. Finally, local celebrities did not become important actors in the climate change landscape, as opposed to their role in the U. S. and other developed nations (Boykoff & Goodman, 2009).

Figure 5 – Sources by origin



The frequency of sources by authorship is presented in Table 5. Stories by journalists and wire services presented very similar source use. The only differences were that journalists made some use of civil society sources (n=15) and regional government sources (n=9), while wire services stories did not use any of them.

Table 4 – Authorship and sources

	<i>Commentator</i>	<i>Journalist</i>	<i>Wire Service</i>	<i>No author</i>
Nat. Gov.	7(28%)	82(29%)	80(35%)	46(33%)
Research/Expert	4(16%)	65(23%)	61(27%)	25(18%)
Multi-state org.	6(24%)	44(16%)	34(15%)	31(22%)
Other	6(24%)	30(11%)	22(10%)	13(9%)
NGO	2 (8%)	25(9%)	25(11%)	14(10%)
Industry	0	9(3%)	2(1%)	4(3%)
Civil society	0	15(5%)	0	0
Reg. Gov.	0	9(3%)	0	0
Local Gov.	0	2(1%)	1	3 (2%)
Celebrity	0	0	3(1%)	2(1%)
<b>Total</b>	<b>25 (100%)</b>	<b>281(100%)</b>	<b>228(100%)</b>	<b>138(100%)</b>

## Discussion

Coverage of climate change in the Peruvian press tended to emphasize the impending effects associated with the issue with no presence of skeptical views. Because of the marginal contribution to greenhouse gases, the coverage had a lesser focus on the country's role in solving the problem, something more prevalent for example in the Indian press (Billett, 2010) and the U. K. tabloids (Boykoff, 2008b). The results most resembled those found in Mexico. Gordon et

al. (2010) argued that in previous studies outside the United States, an international relations frame dominated. In their study, they found that ecology/science and consequences frames were the most popular. Furthermore, this study extends the exploratory work conducted by Takahashi (2011) in Peru for a one-week coverage of climate change during the Latin American and European Union Summit in 2008. The results presented here confirm the dominance of government sources and the limited number of science-framed articles.

The results also revealed that wire services play an important role in the reporting. First, the volume of stories was highly significant. This was consistent with Shanahan's general assertion that coverage in non-industrialized nations have "a reliance on reports from Western news agencies rather than more locally relevant news. This, coupled with sparse coverage of adaptation, has implications for the world's poor, who urgently need information to prepare for the impacts of climate change" (2009, p. 153). Antilla (2005) also suggested that wire services play a critical role in the reporting of the issue in the U. S. Nevertheless, comparative studies would be necessary to assess the extent of these claims. For example, McComas and Shanahan (1999) reported that the *New York Times* and the *Washington Post* included 67% of articles by journalists and only 8% from wire services.

Second, there was no major difference in the use of the frames between journalists and wire services. This might be a function of Peruvian journalists mirroring stories from the wire services, or of editorial selection by Peruvian newspapers. A more comprehensive analysis of wire services stories in other contexts would be necessary to determine if this were the case. The significance of the wire services relates to the fact that their stories did not discuss issues directly focusing on Peru. Although the reporting of international politics would be expected to come from wire services, the high volume of articles not directly discussing Peru could provide an ambiguous representation where there are some important effects (i.e. melting glaciers), but also that the problem is something external to the country.

Third, and related to the previous point, discussion of mitigation and/or adaptation strategies showed some differences. From all articles, 123 mentioned only mitigation, 49 mentioned only adaptation, and 40 discussed both (almost half of the articles had no mention of either strategy). Stories from the wire services discussed adaptation significantly less than stories from journalists. This seems consistent with Olausson's assertion that in the Swedish media, the mitigation frames dominate the coverage and that "The two frames exist parallel to each other, in different contexts, hardly ever appearing in the same news items, regardless of the fact that they constitute two sides of the same coin—how to tackle the issue of climate change" (2009, p. 432). As previously discussed, this bias is even more relevant to developing countries such as Peru that are more vulnerable to the effects of climate change.

In conclusion, the Peruvian press in the case of climate change has been highly dependent on international news flow, especially when covering international relations. The heavy focus on the impacts should give way to stronger coverage of solutions and policies in Peru, especially in regards to adaptation. This shift will depend on the availability and accessibility of sources such regional and local governments that have not had significant media access so far. Finally, although this study provides an extensive understanding of the coverage in Peru, a more detailed discourse analysis could provide a better level of detail about dominant discourses. In their study of the U. K. press, Doulton and Brown (2009) suggested the following: "In constructing, reconstructing and presenting these discourses the press accentuates and perpetuates widely held views of developing countries and the poor as hapless victims facing another set of disasters who can only be helped by the rich Western countries" (p. 201). In this respect, wire services may well be contributing to the extension of these views, something consistent with perspectives coming from

the international news flow literature (Sepúlveda Beltrán & Mayorga Rojel, 2005). Additionally, although this is a single case study, it provides a step forward in the need for comparative studies beyond the developed world (Dirikx & Gelders, 2010). For example, future research could analyze the similarities and dissimilarities of media coverage between Andean countries.

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# **Across Borders and Environments:** Communication and Environmental Justice in International Contexts

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