

A quantitative assessment of the articles on environmental issues published in English-language Indian dailies

Bharvi Dutt*, K.C.Garg*, Archita Bhatta**

*CSIR-National Institute of Science, Technology and Development Studies

Dr. K.S. Krishnan Marg, Pusa, New Delhi 110 012, India.

bh_arvi@yahoo.com, gargkc022@gmail.com

**103 Silver Tower, Vasundhara, Sector 18, Ghaziabad- 201102, India. architabhata@gmail.com

Received 25 June 2013; revised 02 September 2013

The paper examines the coverage of environment-related issues published in 31 prominent English-language Indian newspapers in terms of their quantification and thematic representation. Among all the topics discussed under environment, climate change and global warming got the highest priority with 75% items which constituted more than two third (77%) of the total space occupied by environmental issues. Of these, highest number of items was on adverse impacts of global warming / climate change followed by those on mitigation. Among all the newspapers, *The Times of India* allocated the maximum space to the issues related to environment.

Keywords: Environment, Global warming, Climate change, English-language press, Media, India

Introduction

India is one of the largest democracies of the world, where people elect the governments every five years by the method of universal adult franchise. Geographically, it accounts for a meager 2.4 % of the world's total surface area of 135.79 million sq. km. Yet, India supports and sustains a whopping 16.7 % of the world population, being the world's second highest populated country with a population of more than 1.25 billion¹. More than two thirds of the population still lives in rural areas, mainly agriculturists, artisans or farm laborers. Being a fast growing economy in the world, India's energy consumption has increased by about 4 % over the period 2001 and 2006². This has resulted in the rise of green house gas emissions – rising from 682 Mt carbon dioxide (CO₂) in 1990 to 1342 Mt in 2004³. Also, a citizen from the highest income groups in India comprising just 1 % of the population – emits four and a half times more CO₂ than a citizen within the poorest 38% of the population⁴. The richest 14% of Indian citizens emit 24 % of India's CO₂ emissions⁵. At the same time, in global context, India's share of ~16 % of the world population accounts for only 4.6 % of the global CO₂ emissions¹.

Newspapers in India

Newspapers constitute primary source of communication for general public on issues related to

S&T. India publishes newspapers in as many as 100 languages and dialects; with Hindi and English being the most dominant. Predominantly, these are published from the four metropolitan centers (Delhi, Mumbai, Kolkatta and Chennai) and other state capitals. English newspapers published from these four metropolitan cities account for a major proportion of circulation. Total circulation of registered newspapers/periodicals in India during 2008–2009 was 257,953,373 copies per publishing day. Unlike in many other emerging economies, the press is free in India and the State does not exercise any control over its free and fearless functioning. However, a few national dailies like *Hindustan Times*, *The Times of India*, *The Economic Times*, *The Indian Express*, *The Financial Express* and *The Statesman* belong to the big business and industry houses that might have their own ideologies.

The main focus of the newspapers remain political developments, economy, business, education, development, entertainment, art, culture, sports and crime including economic crime and these also disseminate information on science, technology, health and environment⁶⁻⁷. The coverage, however, varies depending upon the status and place of publication of the newspapers. Newspapers are also potential medium for shaping peoples' opinion on debatable issues like climate change/global warming⁸⁻¹¹ & ⁴. The coverage of climate change/global

warming issues in Indian newspapers has witnessed significant increase during the last decade¹² & ⁴. The approach of the coverage has also undergone a change having found its way into financial papers¹².

The issues related to environment especially of climate change/global warming have assumed global significance encompassing a range of factors including social, political, economic, and scientific, etc. The present paper attempts to portray how English-language newspapers in India have treated the coverage of these issues.

Objectives of the study

- To quantify the number of items pertaining to environmental issues and to identify newspapers that gave emphasis to these issues;
- To analyze the prominence of the reported items and space devoted to them;
- To codify the identified items into global warming, climate change and other environment-related issues; and
- To identify themes, issues, and concerns reflected in items pertaining to climate change and global warming.

Methodology

The study is based on the quantification of issues on environment that appeared in 31 prominent and popular national English dailies published from metropolitan cities and state capitals during April 1, 2008 to September 30, 2008. However, there was no specific reason to choose this period. The advantage of selecting prominent and popular dailies has also been pointed out by Moyer et al, 1995. The selected newspapers make up a large proportion of the total circulation. Authors identified the relevant stories and articles (hereafter called "Items") on various issues concerned with environment published in these selected newspapers. These relevant marked items were cut from the main newspapers and pasted on separate sheets for further analysis. The name of the newspaper, date of publication of the item and page number on which it was published was noted. Each item was codified into an appropriate sub-discipline based on the headline and or the content. The content of the item was studied wherever the headline was ambiguous. Also, on each clipping the type of item (story or article), visual/s, if any, number of column spread and quantum of space measured in square centimeters (cm²) was recorded. Wherever available,

name of the journal/s and the country of the workplace where the research was carried out were also recorded. The data was fed into Fox-Pro for analysis.

Review of literature

In the past, several studies dealing with the coverage of climate change in the media have been published in the literature. However, most of these studies mainly focused on the media coverage of the environmental and climate change issues of the industrially advanced countries of the west like the USA¹⁰ & ¹³⁻¹⁷, UK⁸ & ¹⁸⁻²¹, Germany²²⁻²³, Australia²⁴ and New Zealand²⁵. The US has been the focus of several studies, probably, because it is the top emitter of green house gases (GHGs) globally, producing approximately 25% of GHGs worldwide with 5% of world's population²⁶. Few other important studies on media coverage of climate change and global warming are also available²⁷⁻³⁴. The reporting of environmental issues in media has exhibited differences among different western economies despite the fact that these are global scientific occurrences. For instance, cross-cultural comparison of global warming coverage in France and the US found that France's coverage was more events based, focused more on international relations and offered a more restricted range of perspectives than the US coverage, which tended to emphasize on conflicts between scientists and politicians³⁵. Billet⁴ has also expressed similar views and points out that climate change is represented in highly varied manners at the national level. However, the two fast growing economies of the world like China and India have been left out from the studies of media coverage of environmental issues including climate change/global warming by western scholars except Billet⁴ and Boykoff & Boykoff¹⁰. This gap is of considerable concern given the global nature of sustainability problems and the critical role of communication in the environment politics³⁶. Keeping this in view, Bacon and Nash³⁷ analyzed environmental stories in five South-East Asian English-language newspapers (*Viet Nam News*, *South China Morning Post*, *The Jakarta Post*, *Bangkok Post*, *New Straits Times*) and compared them with the coverage in *The Sydney Morning Herald*. Das et al, 2009 explored the coverage of environmental issues in three daily newspapers published from Bangladesh for June 2007 (two Bangla and one English-language). Srivastava³⁸ examined the

coverage of environmental issues in regional Indian newspapers. The present study is, however, different from Billet⁴ and Boykoff and Boykoff¹⁰ as it covers more number of newspapers (hardcopy) published from different parts of India.

Results

Items and space allocated

A total of 636 items were published on different aspects of environmental issues during the period of study. These items occupied a total space of 150,699 cm². The space occupied by issues related to environment was second highest, preceded by health/biomedical research issues among the entire S&T coverage in the Indian newspapers⁷. The average space occupied by each item was 237 cm², much higher than the average space (183.3 Cm²) occupied by S&T news in Indian English-language dailies.

Topics covered

Among all the topics discussed under environment, climate change and global warming got the highest priority. There were 477 (75%) items which occupied a space of 116,382 cm², constituting more than two third (77%) of the total space occupied by environmental issues. The remaining (159) items were scattered in different sub-topics related to environment and could not be grouped into meaningful homogenous categories, and hence have been grouped as “others”.

Prominence and placement

About 71 % of the items were allocated a column spread of up to four columns; the remaining 29% had a column spread of more than four columns. The proportion of items having a column spread of one to four was almost equal. Of the entire coverage only a minuscule portion (8%) appeared on the first four pages of the newspapers and the rest 92% appeared on other inside pages. The subject that had the highest number of items on the front pages dealt with impact and mitigation.

Newspapers

The total items appeared in 31 newspapers published from different parts of India. Of these, the national daily, *The Times of India* published from the national capital allocated the maximum space to environmental issues (~18%). This was followed by *The Financial Express* and *The Economic Times*, the two business newspapers (Table 1). These three newspapers together accounted for more than one-third of the space assigned by all the newspapers and about 42% of the total items. Certain regional newspapers like *The Assam Tribune*, *Deccan Chronicle*, *Deccan Herald*, *Metro Now*, *Mid Day*, *Mint*, *Mumbai Mirror*, *The New Indian Express*, *The Sentinel*, and *The Telegraph* accorded little priority to environmental issues.

Table 1—Space allocation to environmental news items by newspapers

Sl. no.	Newspaper	No. of items	Percentage	Space occupied (cm)	Percentage
1	<i>The Times of India</i>	166	26.1	26,911	17.9
2	<i>The Financial Express</i>	59	9.3	19,231	12.7
3	<i>The Economic Times</i>	47	7.4	12,118	8.0
4	<i>The Statesman</i>	37	5.8	11,249	7.5
5	<i>The Hindu</i>	35	5.5	7,775	5.2
6	<i>Hindustan Times</i>	32	5.0	7,608	5.0
7	<i>DNA</i>	29	4.6	8,902	5.9
8	<i>The Hindu Business Line</i>	29	4.6	6,987	4.6
9	<i>Mail Today</i>	22	3.5	7,309	4.8
10	<i>The Asian Age</i>	22	3.5	3,743	2.5
11	<i>The Pioneer</i>	20	3.1	4,461	3.0
12	<i>Business Standard</i>	20	3.1	6,055	4.0
13	<i>The Free Press Journal</i>	19	3.0	3,601	2.4
14	<i>The Tribune</i>	18	2.8	4,501	3.0
15	<i>The Political and Business Daily</i>	18	2.8	3,740	2.5
16	<i>The Indian Express</i>	15	2.4	3,279	2.2
17	Other 15 Newspapers	48	7.5	13,229	8.8
	Total	636	100	150,699	100.0

Sources of items

Of all the reported items about half (47%) did not mention their sources. The remaining 53% items used indigenous as well as foreign sources. Of these about 39% were indigenous sources and the rest 61% were foreign sources. Among the foreign sources, 30% were from the UK, 16% from France, 7% from the US and the rest 8% were from other countries. The indigenous news sources were dominated by Press Trust of India (PTI), Times News Network (TNN), Indo-Asian News Service (IANS) and Asian News International (ANI). Foreign news sources were dominated by Reuters (UK), AFP (France), Associated Press (AP) from USA, The Guardian and The Independent both from the UK.

Workplace of research

About 87% of the items originating from 25 countries mentioned the workplace of research reported in the newspapers. The most dominating countries were India (~ 32%), USA (~ 28%), UK (~ 6%), Japan (~ 4%), Australia (~ 3%), Germany (~ 2.5%) and Thailand (~ 2%). These seven countries accounted for 77% of those items that had referred to the place of research. Other major performing countries included Canada and France. There is a striking departure in the workplace of research when compared to overall S&T where the US was the dominating country accounting for 41% of the items followed by India⁷ (16%). Also, in the overall S&T coverage, research performed in 70 countries found place in the newspapers whereas in case of environment it was restricted to 25 countries.

Visual representations

About 56% of the items were supported by visuals, the majority of which were photographs. Of the visuals with photographs, 46% were single photographs, and the rest 3% had multiple photographs. Other forms of visuals included sketches, satellite images, diagrams, graphs and tables. A small proportion of items had multiple visuals. Impact-related items had the maximum number of illustrations.

Journal citation

Of all the items published in different newspapers, 86% did not incorporate journal citations. Only 14% items included journal/s, conference paper/s, reports and book citations. Highest number of citations was

from journals. Twenty-six different journal titles dealing with environment-related issues were cited in the items. A few of these included items from *Nature*, *Science* and *Proceedings of the National Academy of Science*.

Thematic representation

The items were scattered on several issues with a significant percentage (75 %) on climate change/global warming, the rest 159 (25%) were grouped as “others” as they could not be homogeneously categorized. Hence, the thematic presentation will reflect on sub-topics discussed under climate change / global warming (Table 2).

Adverse impacts: Of the 477 items on climate change/global warming, the highest (N=179) dealt with adverse impacts of climate change/global warming. These items occupied a space of 35,267 cm², constituting about one-quarter of the total space occupied by items on environment and more than one third (36%) on climate change/global warming. Several types of adverse impacts that might result due to climate change/global warming were discussed in these items. The highest number of items was on ecological impacts on forests and different species of plants, insects, microbes and animals like penguins, dolphins, dinosaurs, orangutan, tuatara reptile, seals, fishes, elephants and their habitats, birds and their migration patterns, impact on coral reefs and mangroves. Several items dealt with already visible impact of global warming on weather and those that were projected to take place in the coming years like rise in temperature, change in rainfall patterns, fiercer tropical cyclones and increase in the occurrence of hurricanes.

Effects of global warming on human health were also discussed in some articles. These items pertained to rise in vector borne diseases like malaria, cataract, blindness, psychiatric diseases, allergies and increase in HIV positive cases.

A large number of items dealt with melting of Arctic, Antarctic and Himalayan glaciers “the Gangotri” and other glaciers like North Pole and their resultant impact on rise in sea level and sinking of islands and vulnerability of coastal areas to storms. Some of the items discussed about how rapidly the arctic ice were melting and projected how fast they would melt in the coming years. Acidification of ocean water was also focused in one item.

Items on agricultural impacts dwelt upon decrease in crop production of wheat, rice, cardamom and their result on food security. Impact of the melting of Himalayan glaciers on India's overall agriculture and food production were also discussed in some items. Some other items discussed the effect of global warming on bee pollination and loss of fragrance in the flowers, wine and beer production. The economic impact of global warming on economies of different countries including India was discussed.

Mitigation: These items (130) discussed about mitigation policy, development of new technologies and alternative energy sources for mitigation of climate change / global warming. Some items discussed about developed country versus developing country stand on mitigation, domestic mitigation policy, India-China mitigation policy and issues related to carbon credits.

Diplomacy: The central theme dealt with international politics of climate change (53) and India's role in it (11). These involved mainly developed and developing country debate on carbon emission rights and stand taken by various countries on this issue, specially the US and Japan, changes in their attitude towards climate change and steps taken in that direction. Global conferences like the global meet on climate change, the Copenhagen conference and the G8 summit (Japan) on global warming were also discussed in some items.

There were 8 items on India-China inclusion in the mandatory emission caps. The topics included stand of the US on the issue of carbon emissions in the emerging economies. There were 6 reports on Kyoto emission caps. Other articles dealt with the stands taken by poor nations' on the issue and the diplomacy of the science of climate change and cap over emissions.

Politics and policies: Thirty six items dealt with politics and policies of climate change. Most of the items on domestic policies focused on the various aspects of the national action plan on climate change, national solar mission and the various state action plans. International politics like comparison between carbon emissions by India and China, G8 summit on climate change and India's position on banning of coal were also dealt with.

Global warming research: These items (32) discussed topics of global warming research. Highest number of items under this category was on the mathematical modeling of climate phenomenon.

Table 2—Coverage of various environmental issues

Themes under Global Warming/Climate Change	Number of items (%)
Adverse Impacts	179 (28.1)
Mitigation	130 (20.4)
Diplomacy	53 (8.3)
Politics and Policy	36 (5.6)
Global Warming Research	32 (5.0)
Global Warming Cause	28 (4.4)
Global Warming Awareness	12 (1.8)
Adaptation	7 (1.1)
Total	477 (~75)

Other subjects covered included the effect of aerosols on climate change, items against and in support of the warming theory and those linking global warming with Ozone Hole depletion.

Global warming cause: These items (28) included the effect of increasing nitrogen based gases besides the rise in carbon dioxide, and also items on other causes such as solar activity, obesity and non-vegetarianism contributing to warming, the effect of black carbon and the contribution of methane gas in global warming.

Global warming awareness: These items (12) comprised methods of combating global warming, spreading awareness through comedies, children's awareness programs, UN messages to generate awareness, opinion survey, life style and warming.

Adaptation: These seven items included domestic agricultural adaptation, relocating species to save them, protection for riverside cities and necessity of adaptation and technology to test climate tolerance.

Others: The items grouped in this category discussed topics like alternative fuels, biodegradable plastics, biodiversity, carbon emissions, deforestation, eco-friendly buildings, emission control in aviation and ships, and pollution of water and air, etc.

Discussion and conclusion

India is attracting increasing attention within the climate debate due to its physical and political situation. Also climate change is attracting increasing attention within India, as the coverage of environmental and climate change / global warming issues have increased significantly⁴. The topic of environment in Indian English-language press has come to acquire a centre stage by gaining 2nd position at ~15% coverage (the 1st position occupied by health/biomedical research at 36% coverage) as revealed by the predominant position of this topic in

the entire gamut of science and technology coverage⁷. And within the environmental coverage it is the sub-topic of climate change/global warming that occupies the leading position (Table 2). In an earlier study⁶, the proportion of environmental issues was negligible and ranked at 10th position as percentage (~3%) of S&T coverage in Indian English-language dailies. This increase in coverage on environment in the English-language press from 3% in 1996 to 15% in 2008 is a remarkable change, which needs to be put in proper perspective. This predominance of environmental issues in the English-language press may be comprehended by the fact that environment is no longer a relegated domain as its impact is all-pervading which touches the quotidian life of the populace in India, both in rural as well in urban areas. Changing weather pattern, various kinds of pollution, issues of a variety of waste management, various kinds of environmental campaigns, like planting trees, ban of plastics, etc., in addition, big full page awareness advertisements by Ministry of Environment and Forests in print as well as electronic media on environment day and other occasions, celebrations of environment day in schools by organizing lectures, painting competitions, essay writing, some schools organizing students' march on the streets with placards as a part of sensitizing people about environmental issues and concerns. Further, the pro-active role of government agencies in enforcing various environmental regulatory measures, have put the issue of "environment" in cognitive structure of the people. All these issues keep on getting reflected in the press.

The state of environment in India has stirred the conscience of the nation which is evident in various policy initiatives and programs undertaken by the Ministry of Environment and Forests, Government of India, as well the public concern and awareness on the issue during the last decade or so. Various regulatory measures have come into force and their implementation has gradually become more and more stringent as was evident by the meticulous stand taken by the Ministry of Environment and Forests on several issues. For example, in the recent past the Green Tribunal suspended the environmental clearance granted to the POSCO India Private Limited for setting up a steel plant in the state of Odisha and the issue has been in the press as the controversy evolved and unfolded itself³⁹. Various other measures like revoking environmental clearances under Environment (Protection) Act 1986, granted earlier to Cement Plant,

Coke Oven Plant and Captive Power Plant, in District Bhavnagar, Gujarat, in December 2011.

Among the sixteen newspapers listed in Table 1, about one third of the coverage was captured by the newspapers whose focus was business/finance/economics. It may be surmised that their interest in the environmental issues might be governed by the business and commercial interest of their clients/readers who might be looking for various kinds of business opportunities, devising and reformulating strategies in view of the entire gamut of evolving environmental scenario. Also, environmental policy and regulatory issues are germane and crucial to the interests of the business and industrial community.

In the entire gamut of environmental coverage, the predominance of global warming / climate change may also be attributed to the global political activity spearheaded under the aegis of United Nations Environmental Program (UNEP) which witnessed various international meets of top ranking political leaders, officials, scientists and environmental specialists. International diplomacy on the reduction of CO₂ emission and the articulation of India's position on these issues has attracted the attention of the media. Also in the Indian media the award of Nobel Peace Prize to the Intergovernmental Panel on Climate Change (IPCC) jointly with Al Gore the former vice-president of the United States triggered trickling stories and articles on environment, mainly climate change / global warming in the English-press. Although, the prize was awarded in December 2007 but this mere event that R.K.Pachauri, an Indian heading IPCC and bagging a Nobel on the subject of environment brought the topic of environment into focus in the Indian English-press.

References

- 1 Ministry of Environment & Forests, Government of India. *State of Environment Report India 2009*. New Delhi.
- 2 Ministry of Environment & Forests, Government of India. *Annual Report 2007-08*. New Delhi.
- 3 Watkins R, Palmer J and Kolokotroni M, Increased temperature and intensification of the urban heat island: Implications for human comfort and urban design, *Built Environment*, 33(1) (2007) 85-96.
- 4 Billet S, Dividing climate change: Global warming in the Indian mass media, *Climate Change*, (2009) DOI 10.1007/510584-009.9605-3
- 5 Ananthapadmanabhan G, Srinivas K and Gopal V, *Hiding Behind the Poor: A Report by Greenpeace on Climate Injustice*, Greenpeace, October (2007) Bangalore.
- 6 Dutt B and Garg K C, An overview of science and technology coverage in Indian English-language dailies, *Public Understanding of Science*, 9(2) (2000) 123-140.

- 7 Dutt B and Garg K C, S&T coverage in English-language Indian dailies, *Journal of Science Communication (JCOM)*, 11(3) (2012) A01, 1-9.
- 8 Burgess J, The production and consumption of environmental meanings in the mass media: A research agenda for the 1990s, *Transactions of the Institute for British Geography*, 15(2) (1990) 139-161.
- 9 Wilson K M, Mass media as source of global warming knowledge, *Mass Communication Review*, 22 (1-2) (1995) 75-89.
- 10 Boykoff M T and Boykoff J M, Bias as balance: Global warming and the US prestige press, *Global Environmental Change*, 14(2) (2004) 125-136.
- 11 Das J, Bacon W and Zaman A, Covering the environmental issues and global warming in delta land: A study of three newspapers, *Pacific Journalism Review*, 15(2) (2009) 10-33.
- 12 Boykoff M, Indian Media representations of climate change in a threatened journalistic ecosystem, *Climate Change*, 99(1-2) (2010) 17-25.
- 13 Mazur A and Lee J, Sounding the global alarm: Environmental issues in the US national news, *Social Studies of Science*, 23(4) (1993) 681-720.
- 14 Trumbo C, Constructing climate change: Claims and frames in US news coverage of an environmental issue, *Public Understanding of Science*, 5(3) (1996) 269-283.
- 15 Boykoff M T and Boykoff J M, Climate change and journalistic norms: A case-study of US mass-media coverage, *Geoforum*, 38(6) (2007) 1190-1204.
- 16 Antilla L, Climate of skepticism: US newspaper coverage of the science of climate change, *Global Environmental Change- Part A: Human and Policy Dimension*, 15 (4) (2005) 338-352.
- 17 Liu X, Vedlitz A and Alston L, Regional news portrayals of global warming and climate change, *Environmental Science Policy*, 11(5) (2008) 79-393.
- 18 Wilson K M, Mass media as source of global warming knowledge, *Mass Communication Review*, 22 (1-2) (1995) 75-89.
- 19 Taylor N and Nathan S, How science contributes to environmental reporting in British newspapers: A case study of the reporting of global warming and climate change, *The Environmentalist*, 22(4) (2002) 325-331.
- 20 Carvalho A and Burgess J, Cultural circuits of climate change in the UK broadsheet newspapers, 1985-2003, *Risk Analysis*, 25 (6) (2005) 1457-1469.
- 21 Boykoff M T and Mansfield M, 'Ye Olde Hot Aire': Reporting on human contributions to climate change in the UK tabloid press, *Environmental Research Letters*, 3:024002 (2008) (8pp).
- 22 Dunwoody S and Peters H P, Mass media coverage of technological and environmental risks: A survey of research in the United States and Germany, *Public Understanding of Science*, 1(2) (1992) 199-230.
- 23 Weingart P A, Engels A and Pensegrau P, Risks of communication: Discourse on climate change in science, politics and mass media, *Public Understanding of Science*, 9(3) (2000) 261-283.
- 24 McManus P A, Beyond Kyoto? Media representation of environmental issue, *Australian Geographical Studies*, 38(3) (2000) 306-319.
- 25 Bell A, Climate of opinion: Public and media discourse on global environment, *Discourse and Society*, 5(1) (1994) 33-64.
- 26 Mccarthy J J and Canziani O F, *Climate change 2001: Impacts, Adaptation and Vulnerability*, Geneva, Switzerland, IPCC (2001) 89.
- 27 Bell A, Media (Mis) communication on the science of climate change, *Public Understanding of Science*, 3(3) (1994) 259-275.
- 28 Stamm K R, Clark F and Eblacas P R, Mass communication and public understanding of environmental problems: The case of global warming, *Public Understanding of Science*, 9(3) (2000) 219-237.
- 29 Wilkins L, Between the facts and values: Print media coverage of the green house effect, 1987-1990, *Public Understanding of Science*, 2(1) (1993) 71-84.
- 30 Nissani M, Media coverage of the greenhouse effect, population and environment, *Journal of Interdisciplinary Studies*, 21(1) (1999) 27-43.
- 31 Bord R J, O'Connor R E and Fisher A, In what sense does the public need to understand global climate change?, *Public Understanding of Science*, 9(3) (2000) 205-218.
- 32 Musukuma S, Putting environmental reporting on the news agenda, *Intermedia*, 30 (2002) 16-17.
- 33 Hansen A, The media and the social construction of the environment, *Media, Culture and Society*, 13(4) (1991) 443-58.
- 34 Doston D M, Jacobson S K, Kaid L L and Carlton J S, Media coverage of climate change in Chile: A content analysis of conservative and liberal newspapers, *Environmental Communication: A Journal of Nature and Culture*, 6(1) (2012) 64-81.
- 35 Brossard D, Shanahan J, and McComas K, Is mass media coverage of global warming culturally bound? A comparison of French and American coverage of global climate change, In *Proceedings of Climate Change Communication Conference*, Volume 132, University of Waterloo, Ontario, 2004 p. 9-10.
- 36 Josephi B, Journalism in the global age: Between normative and empirical, *Gazette*, 67(6) (2005) 575-590.
- 37 Bacon W and Nash C, Reporting sustainability in the English-Language press in South East Asia, *Pacific Journalism Review*, 12(2) (2006) 106-134.
- 38 Srivastava, M, Role of regional newspapers in dissemination of scientific knowledge on environment and development, *Indian Journal of Science Communication*, 2(1) (2003) 15-22.
- 39 Times of India, Green tribunal suspends environmental clearance to POSCO, 30 March (2012).

