

Moving Toward Communication Solutions for Sustainable Innovation

Building climate change in the media

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Climate change, global warming and sustainability are concepts on the agenda of the media, reflecting reflect preoccupations and alerts based on a scientific consensus. Nevertheless, the reflections of the information about these aspects reveal deficiency in the constructivist techniques of journalism, moreover things that have to do with politics, economic and cultural interest. This article has to do with the evolution and tendencies of the informative flow in relation to climatic change as well as dissonances between scientific and media messages. It also has to do with the growing interest of the communication studies, especially in the Anglo-Saxon world, about the environmental crisis up to the point to suggest the development of a flowing oriented to journalistic communication and sustainable innovation.

Key Words: Journalism, mass media, public opinion, environment, climatic change, innovation, sustainability.

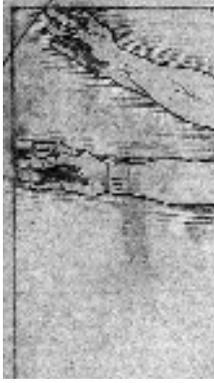
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1. Climate change on the agenda

1.1. General outline

DEFENDING THE ENVIRONMENT and sustainable development have become universal objectives. Yet, pursuing these objectives has conflicted with a social model based on production interests; a model where media interests do not enhance critical opinions or create consensus regarding sustainability measures for the planet.

IPCC, the United Nations Intergovernmental Panel on Climate Change, under Rajendra Pachauri, has made several scientific reports on global warming. There is now wide scientific consensus regarding climate evolution (Zimmerman 2008) -to the point where even the most ideologically resistant sectors are mobilizing. As a result, national initiatives concerning the green house effect of gas emission and broader ecology consciousness are taking place. Yet, this consensus has still met with the resistance of US governments, previous to the Obama Administration, to sign commitments that might



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shake the foundations of its 'affluent' society model. Turning to the media one finds another type of resistance to confronting the problem of climate change: explanations that tend to be inconsistent and non-committal. Media messages regarding the environment are often portrayed through natural disasters, such as tsunamis, droughts and floods, avoiding scientific explanations and having a questionable impact on public opinion.

The United States, under Bill Clinton and Al Gore as his vice-president, did not sign the Kyoto Protocol. In 2007, when Obama's victory in the elections could be predicted, Gore stated that he was skeptical whether his country would undergo any deep changes in its industrial and consumption models. Yet, these models are not sustainable. In fact, they are examples themselves of non-sustainability. Gore's documentary, *An Inconvenient Truth*, which won an Oscar in 2007, broke into public opinion with no new arguments or new scientific facts. The documentary basically gave media coverage to a very serious problem. However, as with other Oscar-winning films, it came and it went. Media 'time' also serves to minimize this problem in today's agenda. Human beings are witnessing, according to ample scientific consensus, a foreshadowing of a darkened stage, caused by man's intervention in the environment. However, the general public watches the *show* with passivity, indifference, incredibility, resignation, helplessness... then looks for the next show to start. While we still can witness public demonstrations concerning a range of local and global problems, including the environment, public expressions of concern are less intense than those we heard of thirty or forty years ago. Social tension and confrontation are not shown in the media and, as such, are not reinforced as viable means of social change. We could even say that social mobilization is not significant after the start of the financial crisis and economic recession.

Although the post-Cold War era has allowed us to turn our attention away from political ideology toward other types of global problems, the environmental movement is still in its infancy in regard to mobilizing public opinion. What role does the media play in climatic change and the building of broader social awareness? Generally, ecology movements have not had the best publicity. Their claims, being pacifists, have been portrayed as anti-system protests, and have been associated with other urban protests. As such, public support –despite the seriousness of the problem– has been limited. When organizations such as Greenpeace use more creative and media-savvy tactics to garner attention, success is still limited and increased awareness is sporadic and short-lived. Soon, they too, lose intensity in the global media.

The Al Gore documentary made news and, as a communication strategy, it got world coverage. The true piece of news was that an American ex vice-president was a defender of climate change and sustainability. This fact, together with all the critiques it triggers, provided the American politician world-wide coverage in magazines, newspapers and television programs as prime news. It was definitely a call to awake a sleepy universal conscience. This performance was probably most effective on politicians themselves, who, ever since started to see sustainability as a new rhetorical argument for their speeches.

Still, the seeds sowed by Al Gore have not flourished in a visible way in people's minds nor in media coverage nor has it led to any significant social movement. The uncomfortable feeling that this *bad news* created about the planet had a time limit on stage. Now, it seems, as the environmental crisis debate shifts off center stage a false sense of calm has returned to the public who can now turn to another crisis... While the media readily introduced the

serious problem of climate change and we have seen significant progress in the quality of the environmental coverage that does appear, without sustained and urgent attention, media-encouraged inertia persists as a powerful force.

1.2. *Approaching the binomial communication-sustainability*

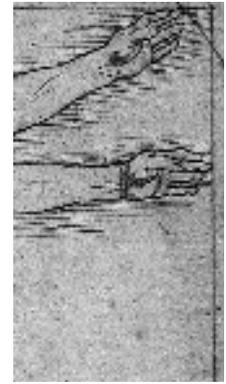
During the past few years there have been several initiatives to relate communication with sustainability. In some cases they are simply campaigns focused on voluntary efforts and targeting individual behaviors with little hope of generating significant change. In other cases, they take already known societal level theoretical approaches to social change, like communication for development, and add the idea of sustainability. As we know, communication is essential for sustainable development. However, the initiatives mentioned usually focus on economically deprived rural areas with the -of course- positive objective of eradicating poverty (FAO, 2007).

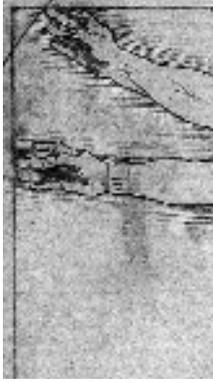
However, the areas where environmental problems are more serious, though, are not located in developing countries, but in the most industrialized areas of the world. These nations are models of consumer society and would make life on Earth non sustainable if the 6,700 million world inhabitants were to practice a similar individual-environment relationship. Therefore, developing strategies of communication to reach the so-called First World seems quite appropriate. These strategies are used by mass media, specifically general public media, to educate people's capacity to discern. This would mean keeping progress through innovation which is destined to readapt the production system and the consumer society with a double aim. Firstly, to preserve the environment, and secondly, to cleanse the pollution caused by human beings.

David Nordfors (2006) developed an Innovation Journalism project at Stanford University. The project takes the classical approaches of innovation explained 40 years ago at the same university by Lerner, Schramm and Rogers and adapts them to a contemporary journalism in digital world. Daniel Lerner assigned the media a determinant role in the process of social modernization. Wilbur Schramm (1964) analyzed the role of communication in helping development. Everett Rogers (2002) dedicated most of his academic career to studying innovation diffusion and its contribution to development from his first essay *Diffusion of Innovations* (1962).

This diffusive approach, which is in the basis for the plan of communication for development, has influenced some Latin American academics, such as Luis Ramiro Beltrán and Juan Díaz Bordenave, and is applied by other authors like Mooreg and Moersch. Diffusion of innovations was introduced as a catalyst of social change processes. Innovations were necessary to incite modernization (Thompson 1998). Concerns regarding this approach to development prompted heated debates in UNESCO towards the end of 70's and they were associated with NWICO and with the proposed communication and information national policies.

The diffusive trend has been criticized by pointing out that some models of communication for development advocate neocolonial ways with the purpose of simply moving an ethnocentric idea of progress from world decision-making centres elsewhere. Srinivas Melkote (2008) and Servaes, Indian and Belgian academics respectively, reach the same conclusion from different perspectives. They critique the application of a Western production model in those countries which are historically and culturally far removed from such a cultural and ideological orientation. Servaes and the Thai academic Patcha-





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nee Malikhao (2004) have tried to separate the Western dominant production model from the ideological matrix of the “communication for development” concept. They redefined it as Communicating for Sustainable Development (Mafalopulos 2005; Miguel de Bustos 2006).

Generally, the trend of communication for development, which is a very present force in developing countries (Hermer & Tufte 2005), is addressed to deprived nations. That is why it has a cooperative nature, supported by government initiatives and action plans as well as international bodies and non-governmental organizations. The concept of sustainability here is more tightly linked with the UN Brundland Report (1987). According to this report, development should not compromise economic nor social future welfare. For this purpose, the high level of consumption and waste would need to be reduced, Earth’s wealth should be rebalanced, birth rate controlled and non-renewable resources used in an intelligent manner. These objectives reach three different convergent spheres of development, that is, economic, environmental and social spheres.

However, the starting points are very different and so are the degrees of dialogue, proposal capacity and social predisposition to social imaginaries so polarized as those who live in relative opulence and those who are trying to leave poverty behind. This is why Nordfors’s approach, complemented by sustainability (Jorna 2006), can have valuable implications for media action in a time of anthropogenic crisis. His approach calls for Innovation Journalism and studies more advanced economies and societies as knowledge, rather than simply production, societies. It is important to note that the effects of this sustainability crisis are not so visible, despite its profusion by the media and the added sensationalism. The crisis does not reach the same cultural echo as millenarianism, Biblical curses, apocalyptic visions or world destruction prophecies. Undoubtedly, it is a publicity market requirement that this period of uncertainty does not mess up the economy.

Ultimately, there is a crisis in communication. This threat is not questioned in scientific literature. However, these arguments cannot permeate media work frames and reach greater journalistic interest. This is obviously the central axis of the concern described in this study. How is it possible from the media to give warning about the already diagnosed state of health of the Planet? How would it be possible to awaken sustainable awareness on sustainability itself? Obviously, through a sustainable dialogue through which current arguments can be reached and public opinion can be created, thus, reducing uncertainties.

1.3. Moving towards communication for sustainable innovation

Communication for sustainable innovation is explained as a strategy which is, in itself, a sample of innovation. It proposes a change in the way media narrates events and a plan of action about its diffusion. However, this change focuses on countries whose consumption is based in a personalized supply-demand relationship with no limits but the individual purchasing power, which sets the personal status. This change affects the message, which would not act so much as a transmission belt for the market and industries. The message would be more scientifically oriented, so that in moments of crisis media would be able to fulfill their audiences’ rights to be informed. This would translate into an action plan for the consumer public that would push structural changes beyond the existing opportunism in environmental cover ups used by certain poor example companies. Miguel de Bustos’ study is to be

taken into consideration at this point. He agrees with Hamelink in the fact that communication is an intrinsic element in human development. He updates some established press myths giving them a new orientation. "The development of communication means and instruments, in order to achieve peace, exercising democracy, promoting freedom of speech, defense of pluralism and diversity are objectives similar to helping small and medium-sized enterprises" (Miguel de Bustos 2006: 32). In his notion of environmental literacy or *mediarology*, he suggests a plan of action using the media and other means of communication. The action plan is similar to the one suggested by Stephen H. Schneider (2002) from Stanford University. It has also been addressed in the work of Walter L. Filho, professor in Frankfurt, who suggests a sustainable and systematic integration amongst innovation, communication and development (Filho 2006).

Media literacy projects (Potter 2001) which are starting to arise in Europe, are supposed to enhance responsible media consumption and develop the critical reading abilities of audiences. The first programs are for primary education. They should, indeed, include the idea of sustainability as the most appropriate means to be well informed, reduce uncertainty and enhance social participation as well as consensus.

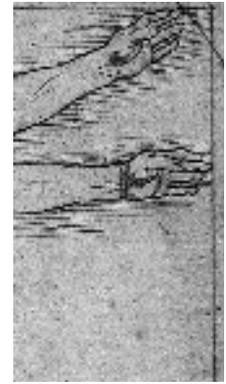
1.4. First world problems

Climate change and the destabilization of the environment are problems that do not originate in rural areas. Neither do they originate in the less developed world areas, which are the study focus of sustainable development. The most difficult battle fronts are at the negotiating tables between national governments and in the awareness of the population living in rich countries. The latter should demand commitments from their governments. Environmental awareness and, therefore, the media's job, is to focus efforts at social change within those nations which have been the worst environmental offenders. The negative, lifestyle effects in those countries are not only national but global, and are punishing selectively some regions, especially those in the Southern hemisphere.

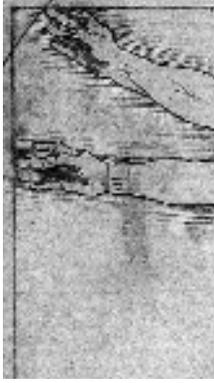
In the so-called First World nations the need to generate sustainability awareness is great. Al Gore, in his particular environmental evangelizing campaign, clearly understood this. He avoided talking about developing nations in his apostolic venture. It is appropriate, therefore, to associate Nordfors' Innovation Journalism to a broader idea, including sustainability. This is how "communication for sustainable innovation" is born.

It is an ideological movement about changing mindsets about the use of non renewable sources of energy. It has to do with the environment and with the transformation of each person's mentality in the way they see their natural surroundings to think globally about their natural heritage. This objective is complex, as there is a visible cooling off of critical awareness and a lack of confidence in social action as a means of change. The media-cultural environment that shapes the dominant opinion, that is, *general public awareness*, has much to do with the lack of participation that plagues the environmental movement. The vast demographic dimension of the general public is the main argument used to avoid confronting serious topics and justifying a diet of entertainment programming.

Communication for sustainable innovation, is not, as it was explained before, another way of communication for development. It is a reassignment of the role media plays in some societies whose opulent culture is on track to an



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unsustainable future. This role is consistent with the idea of “sustainable thinking”, as Guattari suggested towards the end of the 80’s “...it is about reconstructing the group of modalities of the being-in-group. It will take communication interventions and existential changes whose aim is subjectivity” (Guattari 1996: 20). This means a restructuring in social and individual practices under three basic pillars: “social ecology, mental ecology and environmental ecology, under the ethic-aesthetic auspice of ecosophia (...) Refusal to face degradation in these three domains by the media is a restriction that leads to the infantilization of public opinion and to democracy destructive neutralization” (*Ibidem*: 30-1).

Communication for Sustainable Innovation tries to close the knowledge gap between the constructive idea of seeing the world as legacy for future generations and the media treatment of this subject. Unfortunately, these interests do not agree with interests for humanity in general.

1.5. Media-culture cooling off

Some initiatives from different backgrounds have come up in the USA and Europe. Their aim is to seek social awareness of environmental problems, which are intensifying due to scientific alerts about the near future. Amongst journalism academics and professionals there is, nonetheless, great awareness of the continual degradation in the quality of information in mainstream media discourse. Entertainment and leisure are more weighty matters in the media, while more serious information is filtered through expressions and formats that make media it lose value and impact. In addition, media content tends to be about, and speak to, the concerns of the individual rather than of society. That is, the individual side is emphasized over the social one. Expressions such a *happy culture* are prevalent and, as a result, critical minds do not exist.

While there is a significant degree of uniformity across media-culture industries, we can note some cultural and cognitive national differences. Therefore, different clearly cut consumer audiences can be distinguished. This *daily share multimedia* has been studied recently in some European and Latin American countries, yielding highly contrasted results. Hallin and Mancini (2004) established a relationship between the media and the political systems. Now, it is possible to add the media-culture interaction in each national identity (Díaz Nosty 2007). For example, in Northern European countries there is a fairer balance of information content and due to diversity of resources and access to contents. However, in Southern European countries, audiovisual elements and sensationalism are the main consumption diet. Even though in the Scandinavian countries the media exposure time is longer, television accounts for only 35 per cent. In Mediterranean countries television exposure time goes over 60 per cent (*Ibid.*).

As Gitlin (2005) remarks, the public exposed to the audiovisual *happy culture* is more likely to be manipulated. Their critical judgment is less developed and they show less signs of reflection over what they see in their public space. This problem is manifested in Spain by the fact that one third of its population is not interested in major current issues. The problem is more aggravated in other countries in which there is serious dependence on sensationalistic television programs, like in the case of Mexico and Brazil (Díaz Nosty 2007: 29-30). The case of the USA is a clear example of the degradation of media diets and its cultural effects. There, it is estimated that 46 million people are functionally illiterate and 30 million when it comes to reading comprehension (IES

2007). The Pisa Program 2006 whose job is to compare the efficiency of secondary education in several countries, places the USA at number 29 world-wide. According to American analysts, this will force the country to import specialized personnel in order to keep its place as a world leading nation. Paradoxically, at a time when knowledge has become a paradigm in our foundational modern myths, the first world power shows signs of regression and internal gaps of knowledge. The *tabloidization* of the media is yet another contributing factor towards the cooling off of this country cultural façade. As a result, there is public space deterioration (Glynn 2000), a lack of critical judgment (Boykoff 2007), and, maybe, the democracy crisis (Kellner 2005; McChesney 2000).

Philip Meyer (2004) analyzes impoverishment in the press. He predicts the death of serious journalism by 2040. Death caused by excesses of commercial industry, loss of credibility, the relevance of advertising over content, etc. In conclusion, all those factors that, a decade ago, were called the cynicism spiral (Capella & Jameson 1997).

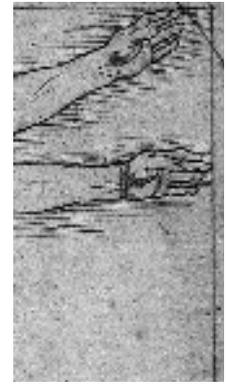
The stimulating of critical awareness is greatly diminished by sensationalistic program contents and poorly outlined media practices. This affects us at the environmental level. Such practices are usually the result of models fed by clear commercial purposes.

1.6. Banalization, building objectivity and climate change

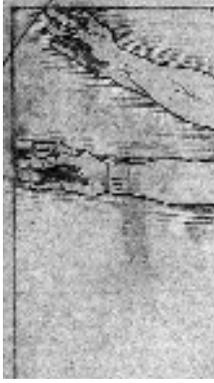
Mainstream commercial television now employs a pattern of reality presentation similar to that what, in an earlier era, would have labeled sensationalism. It is what Glynn (2000) called audiovisual *tabloidization* and is closely linked to Rupert Murdoch's Fox enterprise originated in the United States of America and now in other geographical locations¹. Broadcasting stations do not address climate change problems or any other science-related matters through relevant sources of information. They usually find a catchy headline, such as "According to an Australian university investigation, 70% of Earth surface will be desert by 2080." Then, they embellish the facts with alarming elements. They often seek to create a debate between two polemic public figures or even take the issue to the streets, looking for pros and cons, where the most comical or action-filled answers are aired...

We would expect a better presentation from the press, offering more perspectives and context in regard to climate change. Nevertheless, press attempts to offer objective solutions have been denounced by some scientists as erroneous projections of the realities. Al Gore, in his work *An Inconvenient Truth* explains the big difference between the scientists' consensus and the speculative nature of media interpretations. IPCC experts have emphasized the need to understand objectivity through scientific consensus, thus, giving no room for isolated opinions that contradict the majority. These ideas generally end up taking up as much importance as the dominant opinion. Traditionally, scientific journalism has been questioned due to the minimal and poor specialization in this field (Russel 2006). This questioning is more stressed now with the problem of climate change, which is a subject that allows for subjectivity and sensationalism.

According to Schneider (2001), "It is normal and appropriate that honest journalists give two sides of the story". He wrote this in reference to social and political controversial pieces of news. Scientifically speaking, it is a different matter. Philip Meyer (2007) points out that "journalists must act as scientists. This includes collecting data, finding resources, building a theory



[1] On media tabloidization and its sensationalistic treatment: Biressi, Anita & Heather Nunn (2007), *The Tabloid Culture Reader*, Maidenhead, Open University Press; Glynn, Kevin (2000), *Tabloid Culture: Trash Taste, Popular Power, and the Transformation of American Television*, Durham, Duke University Press; Langer, John (1997), *Tabloid Television: Popular Journalism and the 'Other News'*, London, Routledge; Esser, Frank (1999), "Tabloidization of News: A Comparative Analysis of Anglo-American and German Press Journalism", in *European Journal of Communication*, vol. 14(3), 291-325.



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and then backing it up with evidence. Objectivity means questioning data so that a false conclusion is not reached (...) Journalists that accepted the speech given in the White House on mass destruction weaponry in Iraq were not objective researchers."

About the treatment of current issues, John Merrill (1968) pointed out, four decades ago, an indicator which he called elite or reference journalism. Nowadays, the continual, contextualized and scientifically oriented approach to climate change and sustainability clearly points to a sign where reference press added value can be distinguished. Some professionals, like Andrew C. Revkin², from *New York Times* and teaching staff of the Journalism department at Columbia University, or George Monbiot, from *The Guardian*, emphasize the difference with sensationalism.

2.. The discourse of the media

2.1. Agenda values

In the last ten years, the study of media information regarding climate change has generated academic interest. This is especially so in the United States, Great Britain, Canada and Germany. These studies have normally highlighted the deficiencies in journalism. More in-depth studies, however, try to throw some light on the complex relationship between a scientific source of information and media representations of that information. There are serious lacks related to communication skills of the scientific source as well as in the way the media portrays the information, the most relevant being these:

1. Media information is not usually related to scientific events and alerts but to political events, including the initiatives of Al Gore. This has been so far the piece of news that has created greatest media impact (Boykoff & Roberts 2007).

2. Generally, information is not accurate from a scientific point of view. Lack of specialization prevents journalists from transmitting scientific information rigorously (Russell 2008). Despite these lacks, the media has indeed contributed towards the formation of public opinion (Revkin 2005).

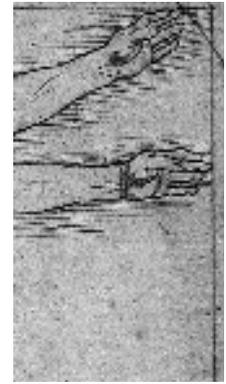
3. Analysts in charge of broadcasting scientific alerts think there are serious lacks pertaining to the information sources and a lack of trust in the media. These factors do not contribute to moving the message efficiently (Mooney 2007a; Rice 2007). These weak areas were pointed out in the first IPCC report and have not been strengthened yet (Nisbeth 2007; Neverla 2008).

4. Information in the media lacks continuity. It fluctuates according to news values in a way that climate change reports are given second place after different news sections and current events (Roser-Renouf & Nisbet 2008).

5. There has been a recent increase in the air time and attention given to environmental issues, despite problems with its reliability and scientific rigor. Between 1998 and 2002 it is estimated that environmental information flows have multiplied four times in the USA (Boykoff & Boykoff 2004: 133). This tendency continued to increase until it reached its highest point in 2006.

6. Information methods varying by country (Fahn 2008; Brewer 2007) and media (Carvalho & Burgess 2005). Usually, elite press has the most accurate presentations of science related issues. Opposing this are the more sensationalistic approaches of popular media (Boykoff & Mansfield 2008) which tend to prefer a crisis-oriented presentation along with its visible manifes-

[2] He has an interesting blog in the digital edition of New York Times -Dot Earth-: <http://dotearth.blogs.nytimes.com/author/andrew-c-revkin/>



tations (hurricanes, torrential rains, polar melting, etc).. .and have an important role educating public opinion.

7. Far more than academic facts, media gives coverage to marginal perspectives, which are not part of the scientific consensus and can give way to skepticism and denial of the climate change problem (Weaver 2003). In some instances, they can lead to real misinformation (Romm 2008).

8. The relationship between powerful industrial corporations and the media is not limited to advertising (Tebeaud 2005). It also involves institutions and *think tanks* (Jacques, Dunlap & Freeman 2008; McCright & Dunlap 2003) who prioritize economic interests over the environment. All these interests are pushed on the agenda. As a result, a very different picture, far from the scientific reality, is drawn (Monbiot 2007a). The commoditization of media (Rice 2007) causes scientific consensus to reach public opinion once it has been modified by interest groups and advertising networks.

9. Poor professional specialization makes journalists vulnerable when it comes to interpreting information from the scientific community (Ladle, Jepson & Whittaker 2005). Moreover, they are susceptible to being affected by the opinions of skeptics and naysayers.

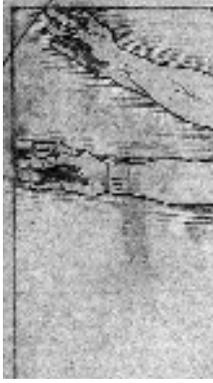
10. The way science related issues are treated is invalidated when journalistic formulas for contrast and balance —pros and cons— are applied. This is especially true if there is a strong dominant current that is artificially balanced with non-validated opinions and hypothesis (Ward 2008; Weaver & Hillaire-Marcel 2004).

11. Difficulties in information transmissions are due to the scientific nature of the sources and to the complexity of the interests involved. In order to overcome these difficulties, there is a need for quality specialization and better communication between science and media. (Hayer & Grossman 2007; Baron 2006).

12. The economic crisis that started towards the middle of 2008 made climate change news less relevant (Ward 2008). As a result, there was a polarization in public opinion as well as the distortion and lack of importance given to this news caused by sensationalistic approaches in major mass media. The environmental degradation countdown is still on. However, there are no public policies to mitigate the effects of pollution. During this transition period, a decrease of world critical awareness could happen. Moreover, the end of the economic crisis may not come with a change of mentality that is oriented to sustainability.

2.2. Constructive weaknesses

There are some balancing techniques for information resources —pros and cons of a matter— which are successful in the field of politics, for example. However, these techniques can be quite risky when applied to the journalistic treatment of scientific discourse (Mooney 2004). In the field of science, there are different protocols to validate and consolidate paradigms. These are grounded in empirical facts. This is why, in the scientific field, consensus over climate change matters is over 90 per cent, while in the journalistic field consensus is significantly less, with relatively more specific weight given to scientific minorities. The need for media to present *two sides* results in the periodic reappearance of scientific opinions which have already been discarded. Informative programs related to science advances to cure some illness is a good



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example of this. It would be odd that media would not trust science and would usually rely on non professional resources such as witchcraft for these issues. Another example would be surgery techniques and fashions broadcast for the general public. That is why Weaver (2003) reminds us that media is not the place for scientific discussion. Neither is the criteria followed by the media's agenda the most appropriate to select the best public debate figures. Scientific construction follows different methods which have different types of interests from media agendas. That is, the economic incentive of the media is to prefer profitable news over non-profitable news.

Balanced treatment is associated with contrasting resources and situated amongst the elite press principles. This treatment is called "an inconvenient principle" for journalism that is problematic for the presentation of scientific information (Boykoff & Boykoff 2006). Frequently, there are foreign interests that contend with scientific progress. These interests are far from the object of information and from science itself. They are dictated by apparently neutral entities and financed by corporations such as Exxon-Mobil. This corporation is known for drawing major disputes in the analysis of media pollution from oil-production resources (Monbiot 2007b).

The dominant scientific thinking regarding climate change has sent a red alert needing mass distribution. The scientific understanding of the problem and the information sent to the public mind are highly contrasted. However, there are more than two poles —science and media— that make this issue more complex (Corbett, Young & Davis 2008). Certainly, some of the deficiencies in the transmission of scientific knowledge are due to the journalist's poor specialization. But this lack of scientific background on the part of journalists is compounded by their need to adhere to the routines and formulas of their profession – not the least of which is to frame issues in a way that will appeal to audiences. However, these are other facets besides journalists and media (Weingart, Engels & Pausegran 2000; Russell 2006). There are other factors to take into account whose scope of operation, interests and power of strategy are diverse. Global warming and climate change debates are fed by sources of different natures, such as scientific, industrial, economic, governing and others (Smith 2005; Jancovici 2007). Certain situations rightly call for investigation of certain scientific facts – other situations call for a public alert. However, both situations are treated to skeptical or negative opinions (Anderson 2007)³ resulting in an increase in the degree of uncertainty (Weaver 2003; Ladle et al. 2005). Faced with the repetitive and accumulative arguments of naysayers, who have a defined strategy, scientific alerts, based on well established facts, must face the same hurdles, again and again (Tabeaud 2005; Rice 2007). From a public service point of view journalistic presentations of science should come after the heart of the scientific debate occurs. Revkin (2005) proposes some criteria along these. For one, journalists need to get their information from prestigious and respected scientists. Expert opinions offered by *think tanks* and *lobbies*, which generally have a tendency to "use" science, should be avoided because of their political nature (Shah 2007)⁴.

Ladle studies some of the reasons that lead to poor information about global warming and climate change. He points out the following three reasons.

1. Science writers lack the necessary knowledge to interpret scientific debate and generally tend to simplify or exaggerate.
2. Science writers look into journalistic resources rather than original documents. That is, they build their information with press statements and news agency releases.

[3] In Canada is the well known case of Tim Ball, a veteran academic who ceased to do investigation some years ago, who has become one of the most flag waving voices in the negation of climatic change. Between 2001 and 2006 he published 39 articles of opinion and 32 letters in 24 Canadian newspapers (Anderson 2007). Ball has denounced the censure of the CBS television channel, which, as with the British BBC, does not balance their information with opinions that are outside of the scientific consensus and academic validation.

[4] A study of the abundant production of American literature which questions climatic change reveals that 90% of the text originates from think tanks known for their belligerent scepticism and negationism (Jacques & Freeman 2008).

3. Climate change news is used for political purposes. NGOs and opinion leaders take advantage and push their interests in the media (Ladle et al. 2005: 239).

There are some news approaches that distort information. Some have to do with meaning, such as the difference between weather and climate (Tebeaud 2005). In other supposedly rigorous studies, the journalist's role can influence the final meaning of the message.

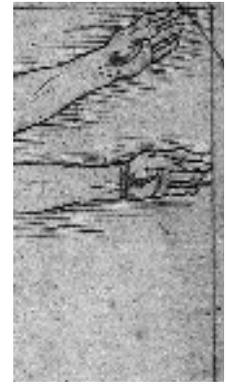
Scientists must take some of the blame for poor science reporting as well. In some cases, environment specialists seek personal publicity so they debate ideas, introduce questions and hypothesis and become opinion leaders in the media (*Ibidem*). "It is a good thing to debate science. However, this debate should not occur in newspapers but in the science community" (Weaver 2008).

Some analysts say the root of the problem is not in the media but in the way science resources communicate their information. They think too much importance seems to be given to the news and generally ignore it. Cees Hamelink⁵ points out that "information is not a panacea" regarding media role in climate change. The problem does not end up in the way scientific alerts are communicated. Finally, we know that people can have information and know what is happening, but succumb to lethargy and choose not to act. There is an even deeper communication problem, according to Hamelink. It is linked to the complexity established by the variables that institute communication action from a systemic point of view. Revkin (2004, 2008) insists that it is not the media's fault only. Certainly, there are basic construction problems. However, there are many lacks in the process involving knowledge build-up, its communication and its transmission. There are also inadequacies in disclosure, precious mediations involved, interests in scientific and industrial areas, etc.

2.3. Media representations

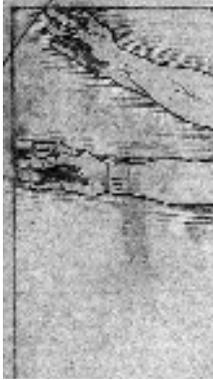
The way climate change information is presented has suffered different types of critiques. These conform to different narrative patterns. In reference to the press, discrepancies from the scientific community originate in the way information is constructed, as IPCC experts expressed. This construction is usually made up of several opinions, trying to offer balance and questioning the full science consensus. The use of special interest sources is only quoted indirectly. There are industrial corporations that have become inductors of skeptical and negative thinking with regard to climate change (Jacques, Dunlap & Freeman 2008). This general criticism (whatever the publishing source might be) turns some specific climate change news into an audiovisual show and into sensationalistic presentations of the facts, totally out of context. This may lead to misinformation (Romm 2008). Surely, these styles are general public media styles. Their characteristics are emphasized even more in the *tabloid culture*⁶.

It is very important to differentiate between the media construction styles, as there are clearly separate proposals. When studying media agenda on climate change, their narrative patterns and their languages cannot be mixed. This is more so if their influence over public opinion is to be measured or if the messages sent are to be analyzed (Ereaut & Segnit 2006). Media content, that is, major newspapers, can influence people who are able to personally or institutionally create public opinion. Such papers are also a dialectic space in which economic and political interests confront each other (see diagram 1).



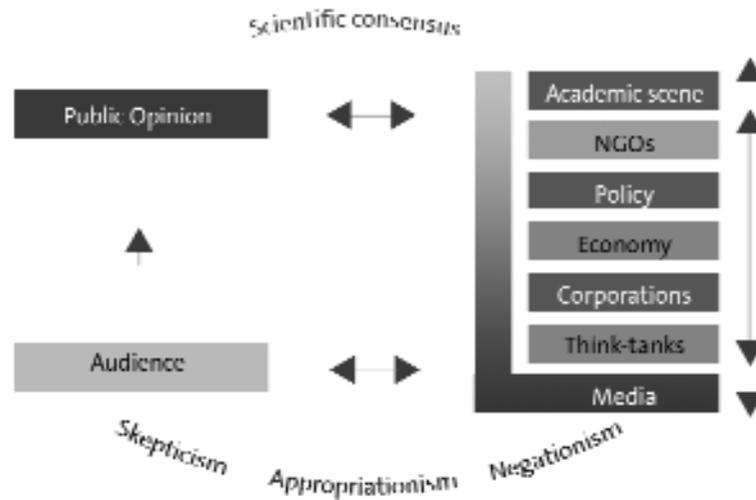
[5] At an international forum. The Hague, Nederland (24.10.2000).

[6] The United Kingdom's tabloids show that one out of three opinions about climate change is skeptical or negationist.



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1. The Symbolic Construction of Climate Change



In popular media, however, climate change information policies tend to adopt a clip culture style. This style consists of shock values, often out of context, with no consistence in their narrative patterns. These exaggerated expressions, which are far from reality, devalue public criteria and take the problem further away from public awareness. This double-sided media presentation and the different relations with the public understanding and assimilation are linked to the interactions that system agents (political, economic, industrial...) exercise over public opinion (see diagram 2). The political use of reality that media creates feeds back its own discourse and contributes to delaying social consensus (Carvalho 2005). Nowadays, according to scientists, the fact an irreversible climate change is happening is not the major problem. The problem is in the application of global policies to minimize environmental decay. However, media's debate is still focused in the first stage.

There are lacks found in the media representation of climate change. But, despite these lacks, media is not the only factor to count on for this incomplete or inadequate approach. There are other factors besides the media which are responsible for public awareness of this problem, as well (Mooney 2007a; Rice 2007; Nisbeth 2007; Neverla 2008). There is resistance from society to understand the seriousness of a problem which is basically invisible to them (Marx et al. 2007) as Monbiot (2007) says, most of the rich countries are located in warm latitudes and will take longer to suffer the first effects. This fact takes the problem further away, including its political exploitation. As British ex-Prime Minister, Tony Blair says, there is a "time lag" between environmental impact and electoral profitability. This is one of the main shock absorber of climate change in the media agenda.

There are other resources polluting climate change presentation. They originate in cinema fiction as a point of reference for future virtual stages (Tabbeud & Browaeys 2008; Lowe 2006; Weaver & Hillaire-Marcel 2004). These resources can be widely found on the internet, too. Monbiot (2007b) addressed them as "rubbish science." They show with sensationalistic patterns the consequences of climate change. Information that is not published in science magazines has great coverage in the net. They are often extensively supported

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by institutions and lobbies (Rogers & Marres 2000). According to PEJ's News Coverage Index, internet has got the largest amount of information on climate change. Its representation values which do not correspond to any other environmental information shares in different types of media. Generally, it is on the web where the greatest amount of toxic information can be found.

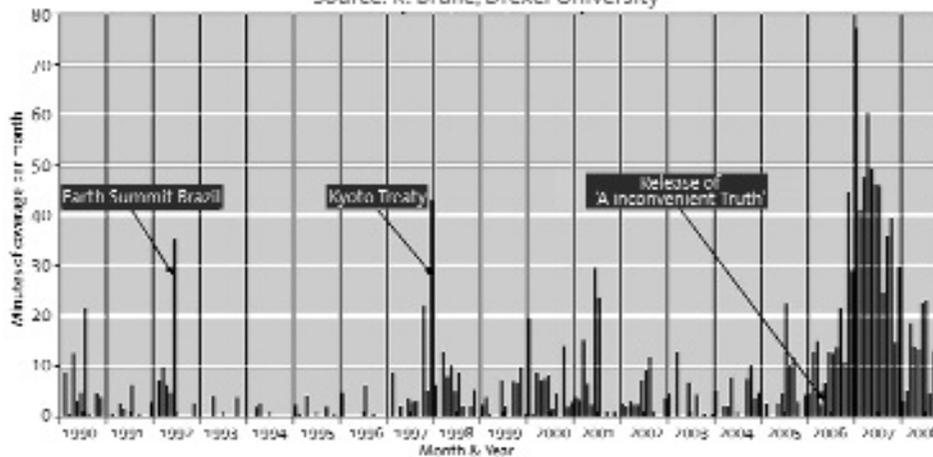
2.4. The appropriation of discourse



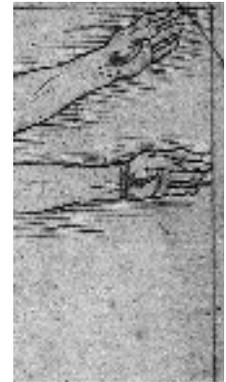
Source: M.T. Burson & J.T. Russett (2007). Media Coverage of Climate Change: 13.

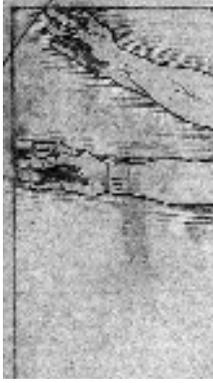
3. Nightly News Coverage of Global Warming (NBC, CBS, & ABC)

Source: R. Brulle, Drexel University



There is another side to the media-climate change relationship. This relationship has become a very efficient instance in this crisis. This strategy is contrary to that of corporations whose position in climate change matters is to be skeptical and negative. Opinion generating institutions, such as foundations, forum and literature are used. In contrast with these, there are some industrial companies whose images used to be compromised because of the effects they





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have on environments when exploiting natural resources, energy sources, etc. Some of these companies have now become pillars for the environment. This make up is normally well backed up by through the so-called Corporate Social Responsibility. CSR has sometimes even appropriated ecology's discourse. Through advertising, sponsorship and public approaches, they make people believe that major energy companies are environment friendly and that they even promote world sustainability. In Spain, multinational companies like Endesa, Iberdrola and Repsol, have communicated information which has contributed to creating sustainability awareness in the general public. However, their main interest is to protect corporations whose activities do not always benefit the environment. Endesa, for example, has some publicity spots in which minors appear envisioning a sustainable, kind and trusting future, thanks to the great efforts of this energy company. That is, they appropriated the thoughts of a sector of society who may have very different opinions regarding climate change. This propaganda was emitted at the same time as Endesa was having serious problems with two nuclear power plants in the North-West of Spain (Ascó and Valledós). Endesa was also trying to build high environmental impact facilities in Argentina (Patagonia). This was shown on television channels for the general public. Greenpeace started a campaign, using children also, to remind everyone about the requirements of sustainability. Greenpeace's answer was not broadcast on television, but it circulated basically through YouTube⁷.

Debate appropriation has to do with the press interest in this matter. Industrial corporations that back up such demonstrations keep a direct, maybe privileged relationship with the media through their publicity investments. Moreover, the lack of institutionalized campaigns by local and national authorities, whose duty is to generate civic awareness, leaves environmental defense to the industrial sector.

This is a critical point in this complex problem (Corbert, Young & Davis 2008). Besides skeptical and negationist attitudes, from the industrial viewpoint (Jacques, Dunlap & Freeman 2008), there is an advertising inaction from public policies. Paradoxically, ecology groups do not seem to trust either governments or the model economic market to solve the environmental crisis. Anti-system claims do sometimes aggravate the problem. They make efforts to try to solve this problem of none effect. For example, some social and humanitarian projects' dependability on the media has been exposed and questioned, as well as some legitimate actions that NGOs need to make to keep up their work and attract backing. At times, these projects and organizations' public actions do not agree with the alerts set by the scientific consensus (Anderson 2009).

From the point of view of Communication for Sustainable Innovation (Nordfors et al. 2006), pressing solutions cannot go through a world revolution that disassembles the current market structures. Public interventions look more appropriate to seek global consensus and define a new structure based on innovation. This new structure would also be based on drastic reduction of the negative effects that can be observed from production and consumption.

[7] These spots can be watched in YouTube (www.youtube.com) under "Spot Endesa, Para los hijos de tus hijos" (Endesa advertisement), and "Contrapublicidad. Endesa, para los hijos de tus hijos" (Greenpeace spot).

2.5. Interest measurements

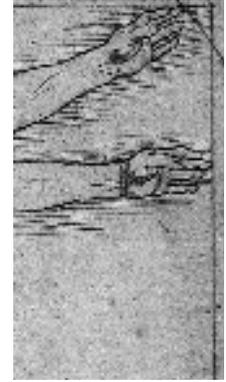
Generally, the analysis of media's behavior regarding climate change is focused on measuring the information flow, content agenda values and its general framework, main events, semiologic analysis, etc. These investigation practices are more widespread in the United States (Tumbo 1996; Antilla 2005; Boykoff, J. 2007; Boykoff & Boykoff 2007; Kuha 2009; Poodley 2009) and Great Britain (Boykoff & Boykoff 2004; Doultton & Brown 2007; Boykoff & Rajan 2007; Boykoff & Mansfield 2008; Kuha 2009). They are also present in Germany (Peters & Heinrichs 2008) and Canada (Klinsky 2007). These practices can be found in some other countries in a lesser degree.

There are comparative analysis between the United States and media in some other countries (Dispensa & Brulle 2003; Brossard, Shanahan & McComas 2004; Boykoff, M. 2007; Maassrani 2007; Takahashi 2008). These measurements show the development of environmental issues. Media's influences can be seen in contrast with general public opinion. For instance, in a comparative study between media in the United States and in Great Britain (see graph 4) it is visible how in the last few years there is a serious growth related to environmental values in both nations, although it is greater in the British media. Studying data from 50 headlines in 20 countries (Boykoff & Mansfield 2008), a revealing finding emerges; the presentation of the film *An Inconvenient Truth* and the following actions by Al Gore were the facts with most historic visibility related to climate change and global warming (Nisbet 2008). That said, another revelatory finding is that increasing the information flow does not necessarily lead to a change in public opinion. This is especially true when media uses shows and sensationalism, as these manifestations increase people's insecurities. Mooney (2007b) called it the "Al Gore paradox." The growing attention that American major television stations are paying to the climate change issue (see graph 3) does not agree with public opinion surveys, which remains stable. This fact continues the same in different geographical areas (Tabeaud 2005).

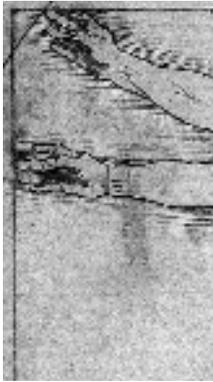
According to Gallup's data, in the last few years in the United States there is an increase in the number of people who think climate change is provoked by natural means rather than by human being. This is a very important issue. While in 2001, 33 per cent of the population thought that climate crisis was due to nature, this opinion reached 38 per cent in 2008. At the same time, the anthropogenic opinion would decrease from 66 to 58 per cent. However, public awareness on this problem was emphasized during this period, going from 31 to 40 per cent of the population. There is no visible change on social perception of media information on climate change.

The economic crisis distracts press interest from climate change matters. This is according the studies of media impact, which are normally in agreement with public opinion. In the United States, there is a decrease in the position that environmental problems use to have in people's minds. At the time of the last presidential elections, a Gallup's survey (graph 7) revealed the falling in the degree of preoccupation about climate change matters. This went as far down as the index in 1987. It is, no doubt, the result of the financial crisis. In 2009, interest rates have fallen. According to the indexes given by Pew Research Center⁸, environmental issues fall to number 16 amongst the rest of the preoccupations, while global warming goes back to 20.

However serious the economic recession is, political journalistic discourse and other public spaces manifestations have not shown any clear relationship between the recession and the *American way of life* that is prevailing in rich



[8] Pew Research Centre for the People & the Press, Economy, Priorities in 2009.



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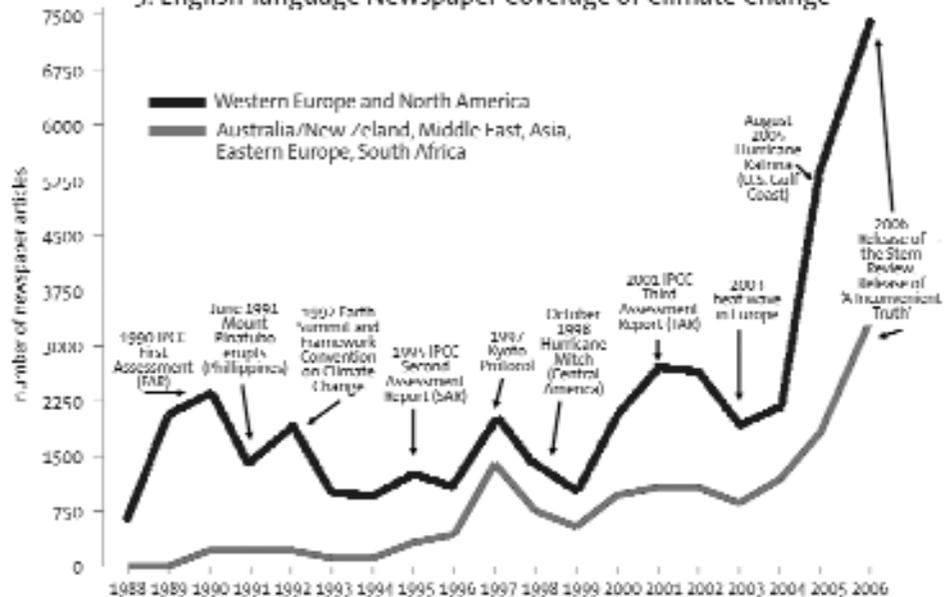
countries. The leaning of banking, industrial corporations and other speculative entities over the State has not lead to a significant questioning of this model⁹.

4. United States and United Kingdom Newspapers Coverage of Climate Change



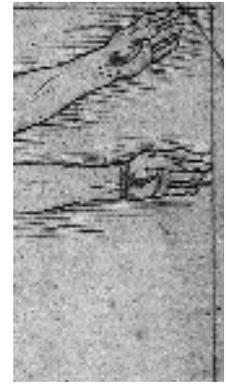
Source: M. Boykoff & J. I. Roberts (2007), Media Coverage of Climate Change, 23.

5. English language Newspaper Coverage of Climate Change



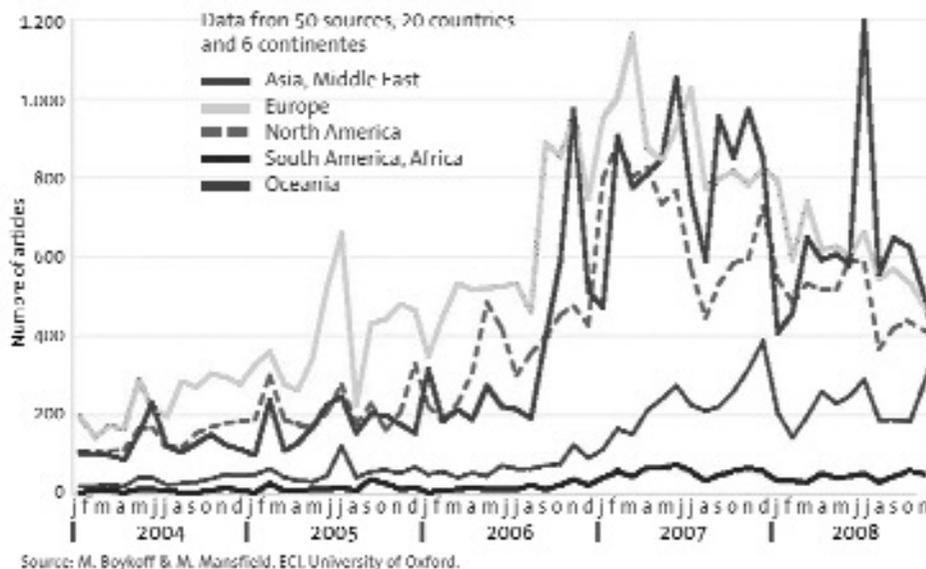
Source: M. I. Boykoff & J. I. Roberts (2007), Media Coverage of Climate Change, 30.

[9] President Obama's proposals and advertising regarding the change of direction in the position the United States holds on environmental problems and international rectification of the effects caused by climate change crisis are quite significant.



Journalistically speaking, the crisis makes major system economy agents depend even more on media. This is done through advertising. These economy agents usually take on values from the media agenda, which is supported by consumption as a highest personal goal. According to a centralization criterion over audiences' priorities, this crisis is forcing the media to make production cuts. These cuts affect non-central issues negatively. Points such as reducing personnel, shortening pages or specialized sections, including environmental matters, are erased from the agenda. From a psychological point of view, this is a time when the crisis' lash is intensely felt by the economy of audiences. At this time, awareness of other issues could trigger other preoccupations, which apparently are of lesser importance. This would cancel media's satisfaction level. News are focused in the moment, time and space-wise.

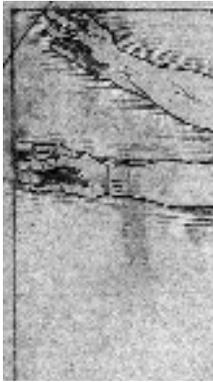
6. World Newspaper Coverage of Climate Change (2004-08)



2.6. Study samples

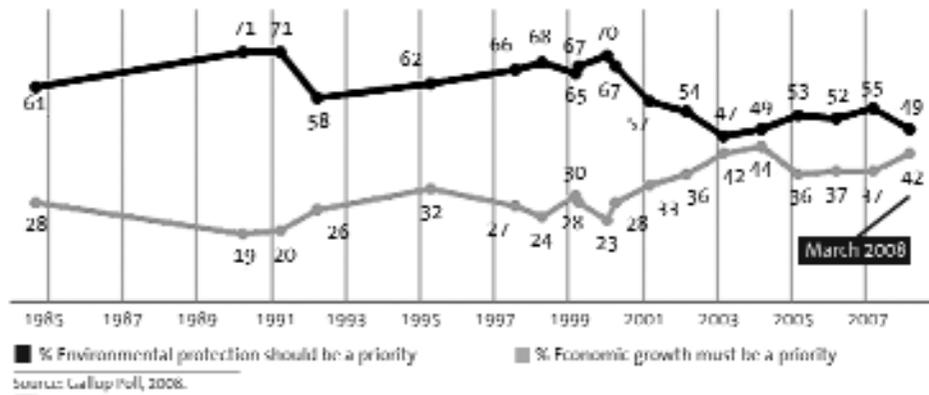
Academic studies about the relationship between media and climate change are scarce. Just a glimpse at British and American statement proposals throws some light at this vast investigation field (Cohen-Bacrie 2006; Corbett 2006; Parratt 2006a). There are many suggestions from journalism and communication points of view. There is an emergent current about this issue which is also prolonging the old controversy about science in media. This is bound to develop a strategy in communication for sustainability.

A scientific symbiosis is suggested here. That is, an agreement between environmental science and academic thinking on communication. Climate change alerts can be, thus, followed by more effective communication strategies and a better introduction of this debate at a social level. From the communication science studies viewpoint, these are the main points to zero in on.



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7. Evolution of American Public Opinion on Policy Priorities



8. Evolution of perceptions about the coverage of climate change in the media (United States, 1997-2008)

Year	Exaggerated	Correct	Under-Stimated	No opinion
2008	35	33	29	2
2003	33	29	33	2
1997	31	34	27	8

Source: Gallup pol. [www.gallup.com/poll/1615/enviroment.aspx]

1. Content analysis; what media construct and how it is done. Information background, its significance, its continuity in the agenda, some information gaps and, quite relevantly, identification of information of major issues and their resources. Ultimately, how the news discourse is generated and who generates it.
2. Taxonomic differentiation of construction models in journalism and in climate change. There are clear differences in news presentation and treatment by popular and sensationalistic media.
3. Analysis of differences and controversies between major system agents. In order to understand the existing gap between science and media manifestations about the same issue, other gaps must first be studied. Such is the case with scientists, politicians and government, which is characterized by conflicting interests –identifying these interests is an objective of investigative journalism. Industrial and economic pressure, which make media discourse more difficult to interpret. Also, pressure from industrial and economic forces, which complicate the interpretation of media discourse and processes for educating public opinion.
4. Enquiring web resources, which are abundant, regarding climate change. However, because their content is varied, credibility, transparency and identity of resources are to be investigated, as well as consensus taken with dominant opinions, etc.
5. Analyzing the instruments. Sometimes, deficiencies in the message are due to poor specialization skills and journalists’ weak education in particular areas. By seeing this under a different focus, there are some lacks in academic institutions concerning the training of future journalists.
6. Identifying and analyzing interferences in the construction of reality by

the media. This is a basic aspect, consisting of getting to know the existence, direction and intensity of forces fighting transparency. Other interferences in messages such as news becoming sensationalistic shows, creating more uncertainty, can be included here. These are all aspects that can distort basic journalism logic and ethical principles.

7. Pre-agenda analysis. Studying virtual ideological and economic scenarios in which contents are produced and how interests of different agents can modify media information.

8. Sensationalism and *tabloid culture* studies and how they influence people's mindsets. Their influence in slowing public opinion from being committed to climate change problems.

9. Psychological and sociological analysis of personal and social defense mechanisms when faced with challenges. Effects of induced fear, sensationalistic shows in the perception and assimilation of audiences' opinions.

10. Systemic-constructivist analysis as a strategy accompanying science through media nutrients which feeds public opinion. Proposals from the point of view of civic journalism.

11. Analysis of the role media have in transmitting climate change messages (coherence or dissonance in public policies). Study of communicating public policies in order to help develop social awareness regarding environment.

3. Conclusion. Within Systemic-Constructivist Logic

The study of sustainability, as a project to create cultural imaginaries which are committed to environmental issues, has to do with communication to a certain extent. Here, communication goes beyond the analysis of media approach to climate change and global warming. It would also go beyond the study of the existing gap between science proposals and the way media feeds general public opinion.

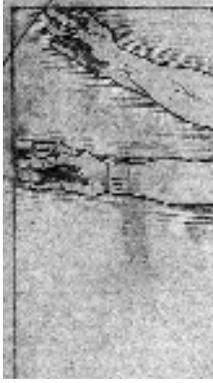
Sustainability is not just economic and industrial applications in order to correct environmental decay, but it is also about finding cultural solutions that can assume the responsibility of ecology awareness, and passing on the world heritage (as defined by UNESCO) to future generations. World heritage includes the biosphere protective layer.

It is fine to talk about Communication for Sustainability (Carpenter & Servaes 2006; Lin 2008; Miguel de Bustos 2006; Ward 2008a). However, it is good to talk about sustainable media. This includes those who transmit information for the purpose of minimizing uncertainties to avoid public intoxication. It also includes enhancing public awareness about the reality that is being transmitted.

Communication is a broad subject which can be studied academically and from other perspectives —academic, legal, psychology of culture, political science, political economics, pedagogy, etc. From these different perspectives intersecting and reinforcing arguments are created. These arguments are keys for sustainability. They are needed to complete scientific climatology studies. From a systemic-constructivist viewpoint, they can help explain science alerts on climate change to the general public, in a more efficient manner, closer to the social perception of reality and to the creation of public opinion.

However, this interdisciplinary complicity is conditioned by time, which is the variable involving climate change process. Long academic discussions on the subject are not enough to enact science consensus. More is needed, such





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as a follow-up strategy already explained by the science consensus. That is, progressive environmental degradation by non-sustainable production methods and energy consumption.

The British and Americans have given relevance to the study of the relationship between communication and climate change. This is noticeable in the bibliography at the end of this study. While the Bush administration distanced itself from, or vaguely committed itself to, finding a solution to this problem in the United States, academic work and study units were created in the universities, as well as scientific discussion forums and empirical analysis. In spite of this effort on the part of the academic world, most of the studies are limited to media approaches to climate change, analyzing constructive mechanisms and reducing the controversy between climatologists and media to the inadequacies and usage of the scientific message. There is a lack of deep studies on media pre-agenda values. That is, on interests which are conditioning media narrative or the ideology extent of the press. It is difficult, for instance, to make a list of causes for climate change. When they are attributed to human actions, they are placed in the general frame of "human action", where poor and rich countries are placed at equal levels and responsibility for the more aggressive environmentally damaging activities is diluted.

There are arguments that lead to sustainable innovation as a strategy for progress in knowledge society. These arguments agree with systemic constructivism, such as Niklas Luhman said, according to which a reality/identity related to ecology awareness should be created. Despite the voluntaristic appearance of the proposal, this statement can be included in an ethical model of communication for social consensus. It is a new foundation of the social contract for the creation of universal awareness of Common Heritage and generational sustainable heritage. Sustainable ideology is a modality of World view which includes the principles of proactive ecology. This ideology, nonetheless, gives special prominence to the many contradictions in the dominant role model in today's society. That might be the reason why the richest countries in the world are usually more reluctant to adopt efficient measures against this change. Borrowing Guattari's term, the ecosophic nature of this change, would translate into a review of some values which define a life-style. That is, change cannot be reduced to Al Gore's salvation measures.

Culture and media cooling off maintains a vague relationship with climate warming. The opinions it feeds are indifferent, uninformed or not committed with sustainability. Excessive commercial usage invalidates responsible agenda points and the right of information¹⁰. This lack accentuates the relevance of new communication policies and the role they must play in adjusting media towards sustainability. This objective could find a natural experimentation field in Europe, where public television has a high audience percentage rate.

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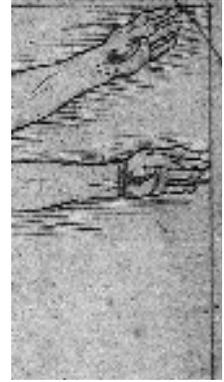
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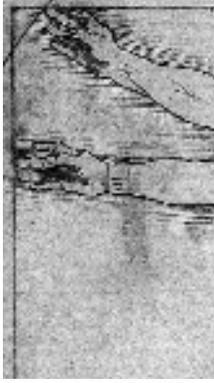
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<http://www.griffith.edu.au/faculty/ens/gje/issues/2006-2/articles/gje-2006-02-barker.pdf>

[10] Regarding media's lack of consensus about climate change, there is obvious pressure from some industrial sectors, which are promoting the negationist current. One example is Heartland Institute, influenced by oil, tobacco, automotive industries, etc. In the past, some unfortunate scientists gained a fortune by negating tobacco and alcohol's adverse effects.

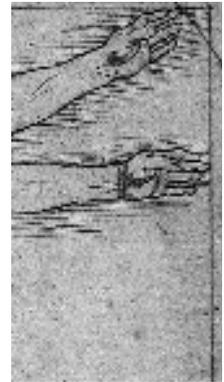


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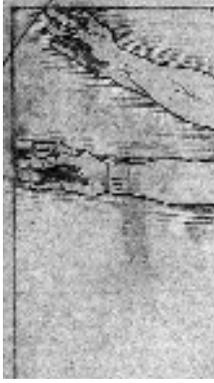


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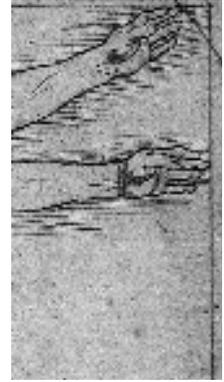


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