CAPÍTULO X

MEDIA COVERAGE OF CLIMATE CHANGE MITIGATION IN THE SPANISH PRESS

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Abstract

This article analyzes how the Spanish press covers the mitigation of climate change. We have used the search engine MyNews to study in El País and El Mundo, the newspapers with the largest circulation in Spain during the years 2016 and 2017, the news that includes the words "mitigacion" o "reducción de emisiones", y "cambio climatico" o "calentamiento global" in the most circulation newspapers in Spain in 2016 and 2017: El País and El Mundo. To explain how mitigation is covered by the Spanish press, we have used a series of categories and variables. As a result, we find an important difference between the urgency expressed by the scientific community and the reduced presence of this topic in the Spanish press.

Key words

Communication, Mitigation, Climate Change, Global Warming, Mass Media

1. Introduction

Probably 2018 will be a key moment in the perception of the risks caused by climate change. The Global Warming Report of +1.5° C[53], published by the Intergovernmental Panel on Climate Change (IPCC), showed the consequences of an increase in temperatures between 1.5° C and 2° C, the maximum indicated in the Paris Agreement. To maintain the 1.5° C threshold, "unprecedented" changes, as well as "fast" and "deep" changes would be necessary. If we continue with the current volume of emissions is likely to reach that threshold between 2030 and 2052. It is therefore necessary to reduce 45% of CO2 emissions in 2030 and eliminate emissions by 205054. This task is as complicated as a priority55. The effects caused by climate change, especially on several hundred million poor people, would be reduced if the temperature increase were 1.5° C and not 2° C.

This report has described the risks associated with the threshold between 1.5° C and 2° C, increasing the risk in four of the five areas of concern. He also explains that reversing global warming after reaching 1.7° C during this century would require returning the CDR (Carbon Dioxide Renoval) to an already impossible level. In addition, the report indicates that reaching between 1.5° C and 2° C could activate the instability of the sea ice layer in Antarctica and the irreversible loss of the Greenland ice sheet.

To this attention call of the IPCC lately joins a greater interest for the climatic feedbacks. Molina *et al.* (2018) think that the Global Warming Report +1.5° C has underestimated the threat of climate change. According to them, the report does not talk about turning points that could further destabilize the climate: "about the cluster of six similar climate tipping points that could be crossed between today's temperature and an increase to 1.5 degrees –let alone nearly another dozen tipping points between 1.5 and 2 degrees". The report also does not address "the five percent risk that even existing levels of climate pollution, if continued unchecked, could lead to runaway warming –the so-called *fat tail risk*".

Another important academic text in 2018 is *Trajectories of the Earth System in the Anthropocene* (Steffen *et al.*, 2018), which has been the most

53 https://www.ipcc.ch/sr15/

54 The V Report of the IPCC links the 2º C to a reduction of global emissions of GHG in 2050 from 40% to 70%, and levels of emissions of GtCO2eq close to zero in 2100 (IPCC, 2014b)

55 Althought the Group I of V Report states that it is not certain that we do not reach 2°C even if it is no longer emit anything (IPCC, 2013: 27), chances of getting the increase below 1.5°C exists: "Only a limited number of studies have explored the stage with the best chance to not driving at temperatures below 1.5°C by 2100 compared to pre-industrial levels" (IPCC, 2014b).

cited paper on climate during 201856. The aticle analyzes the risk that cascade feedbacks may lead the Earth to a "greenhouse" point: "This pathway would be propelled by strong, intrinsic, biogeophysical feedbacks difficult to influence by human actions, to pathway that could not be reversed , steered, or substantially slowed ". For its authors, “where such a threshold might be is uncertain, but it could be only decades ahead at a temperature rise of ~2.0 °C above preindustrial”. Another study by Rocha et al. (2018) showed that 45% of all possible environmental collapses are interrelated and could amplify each other.

Mitigation is the great solution, internationally agreed, to face climate change. Following the reports of the IPCC, it is observed that the mitigation has incemented its presence and its location in the Working Groups (Fernández-Reyes, 2018a). In fact, over time, the scientific community has been increasing the alert tone[57].

Although mitigation is essential, the steps that have been taken on the international scene are insufficient. In the Copenhagen Agreement, there was no commitment to ensure that the temperature did not rise above 2° C (Meinshausen et al, 2009, Peters et al, 2012, Rogelj et al, 2012, Steinacher et al, 2013). The same happened in the Cancun Agreement (IPCC, 2014b: 12). At the Paris Summit, once again, the reduction proposals made by the countries responsible for almost 80% of greenhouse gas emissions were also timid. Christiana Figueres, Executive Secretary of the UNFCCC, pointed to 2.7 ° C as the figure associated with the fulfillment of country promises, but other sources indicated that contributions planned at the national level (INDCs), would mean an increase in temperature between 2.7 and 3.7 ° C (World Resources Institute)[58]. At present, INDCs are still insufficient, far from the objectives pursued by the Paris Agreement (Nieto and Carpintero, 2016, Spash, 2016, Viola, 2016, Nieto et al, 2018). According to Climate Action Tracker, with the INDCs by December 2018, the temperature would rise 3° C59.

For years, the international community focused on the goal of limiting the increase in global average temperature "below 2° C" with respect to preindustrial levels, because this objective was considered to be an agreement

56 https://www.carbonbrief.org/analysis-climate-papers-most-featured-in-media-2018

57 The IPCC press release (04/13/2014) after the presentation of the contribution of Working Group III to the V Report says: "to avoid dangerous interferences in the climate system, we can not continue with the status quo, and the containment of climate change needs a Copernican turn at the technological, institutional and human levels."

58 Estimates for Global Temperature Rise with INDCs above preindustrial levels

59 https://climateactiontracker.org/global/temperatures/

of the scientific community on the threshold between security and catastrophe (Fernández-Reyes and Coghland, 2015). However, the scientific community was already aware that this objective was a political decision that carries a high risk of impact on some parameters (Richardson et al., 2009, Anderson and Bows, 2011, Hansen and Sato 2011, Hansen et al. al., 2013). The international eminence climatologist James Hansen proposed to maintain the level of CO2 concentration in the atmosphere at 350 ppm or less to preserve climate system similar to the prior pre-industrial levels60. This is closer to a temperature increase of 1 or 1.5º C than to about 2° C. However, the idea that the 2° C target was actually insufficient did not have much acceptance among politicians. For example, in the Cancun Agreement, where the objective of 1.5° C is mentioned, or in statements by Christiana Figueres61. Since the Copenhagen Conference, the 1.5° C target also appeared in official UN documents, and some delegations even suggested a target of 1° C (IPCC, 2014b).

Following the publication of "Global Warming of +1.5 ° C" Report, it is now considered that the risk is greater even with a smaller increase in temperature. This means that we are at a decisive moment, with a climatic emergency that requires a large-scale change. This urgency tone was shown by the Secretary General of the UN, Antonio Gutierres, in a message to world leaders: "If we do not change the course before 2020, we may not be able to prevent climate change from being uncontrollable, with disastrous consequences for the human beings and all the ecosystems that sustain us"62. Despite scientific (IPCC, 2018), political (Paris Agreement, 2015) and economic (World Economic Forum, 2019) consensus, significant changes have not been achieved to ameliorate this colossal challenge. According to the IPCC, during the first decade of this century there has been a historical record in the world emissions of greenhouse gases (GHG). These emissions are increasing from 1970 to 2010 and have had an absolute growth during the last decade of this period (IPCC, 2014b: 6). At the end of 2018, the World Meteorological Organization (WMO) noted that the years 2015, 2016, 2017 and 2018 were the four warmest years since records have been recorded63.

The media have done an important job disseminating science and have played a decisive role in admitting the importance of climate change. How-

60 According to Hansen and his research team (2011), to preserve a planet similar to this, we must reduce CO2 emissions to a maximum of 350 parts per million (ppm). This means reducing emissions at a rate of 6% per year, starting in 2013, and for fifty years, in addition to reforesting as much as possible.

61 www.elpais.com, 02/06/2011

62 https://news.un.org/es/audio/2018/09/1441282

63 Report State of the Gobal Climate 2108

ever, they promote the production and consumption model that causes climate change. Therefore, the media are both expectators and actors of the social representation of climate change and resilience. In fact, they can play an important role in favoring or limiting greenhouse gas emissions. As Alley (2017) wrote, "The future of climate change mitigation and adaptation will likely depend on the effectiveness of the news media content to motivate audiences to take action and support proactive policies."

Citizens are informed about climate change mainly through television, advertising campaigns and newspapers (Meira et al, 2013). The Internet, especially social networks, is becoming increasingly important as a source of information. Therefore, the media works like a channel of indirect formation of the citizenship. Thus, climate change is becoming so important that, at the last Residencial Congress of 2018, held at the University of Santiago de Compostela, an "educational climate emergency program" was proposed, locating this challenge at the center of education64.

Media coverage of climate change mitigation strategies and research on how this treatment is, are two important challenges to be able to elaborate active policies against climate change. This work is in addition to the research that analyzes the communication of mitigation on the international scene (Alley, 2017, Bickerstaff et al., 2008, Fernández-Reyes, 2014, Fernández-Reyes and Aguila-Coghlan, 2015, Koteyko et al. , 2010, Moser, 2012, Ockwell et al., 2009, Okaka et al., 2017, Takahashi and Meisner, 2013, among others). Research on how climate change mitigation is communicated is still exhaustion, at least as far as the word "mitigación" is concerned. In fact, there is research on the different sectors of mitigation or on reducing the causes of climate change that do not occur with this term.

The objective of this study is to analyze different perspectives of mitigation and emissions reduction communication. For this, we analyze newspapers, a very interesting type of media that brings a wide range of nuances in the debates on climate change (Dirikx & Gelders, 2008). *El País* and *El Mundo*,

64 https://www.adaptecca.es/recursos/noticias/solicitan-un-curriculum-de-emergencia-que-ponga-al-cambio-climatico-en-el-centro

with its opportunities and weaknesses, offer us a valid news sample for the study of mitigation coverage in the Spanish press65.

2. Objectives and Methodology

The main objective of this work is to explain how climate change mitigation is covered in the Spanish press. For this, we have defined several categories and variables that allow us to identify how the social representation of mitigation is being constructed through the press. Although we have used a research process and categories similar to those used in a study conducted on the Spanish press from LIFE SHARA project66 (Fernández-Reyes, 2018b), there are some differences.

The methodology used in this work is content analysis (Bardin 1986, Gaitán and Piñuel, 1998), which has been applied to each article using a series of variables and categories and consists of the following phases:

a) Search and compilation of newspaper articles that speak of "mitigación" or "reducción de emisiones"

b) Classification of each of the news collected according to the variables and categories that we have previously defined.

c) Statistical analysis of the results and interpretation of the results.

65 In a quick search to find out how "mitigation to climate change" appears on social media, we find these terms in few Facebook pages ("People" and "Groups" sections). They are more numerous in the "Pages" tab, although they are not specific content of mitigation. On Twitter, in the "People" group, there are few pages that focus on "mitigation", and in an important part of these, mitigation accompanies adaptation. In Instagram there are few accounts like "People" that are called "mitigation". There are also some "Hashtags" references, although minority compared to references in English. Google Trends does not provide relevant information when we search in Spain, since 2004, for the "Mitigation of climate change" (with the preposition "ante" and the contraction "al" the search does not have enough data to show results). The result shows a graph without differentiated stages. When performing a search on mitigation in the "All" option, the results differ in Google with the formula "mitigation to climate change" (91,700 references appear), with the formula "mitigation of climate change" (508 results appear), which the "mitigation against climate change" formula (13,800 appear). They are much smaller than when looking for "adaptation to climate change", in which 2,920,000 appear (search conducted on December 24, 2018)

66 This research was funded by the LIFE SHARA project "Sharing Awareness and Governance of Adaptation to Climate Change", coordinated by the Secretariat of Agriculture and Fisheries, Food and Environment, Ecological Transition -through Fundación Biodiversidad- and with these partners: Autonomous Organization of National Parks, the State Meteorological Agency, the Spanish Office of Climate Change and the Portuguese Agência do Ambiente.

2.a. Compilation of newspaper articles about "mitigación" or "reducción de emisiones"

Mitigation means "a human intervention to reduce what causes greenhouse gases or improve their sinks"67. The reduction of emissions is a part of mitigation. In this research we are interested in studying the terms "mitigación" and "reducción de emisiones". We have added "reducción de emisiones" because we have detected that synecdocs and metonymies are commonly used to identify mitigation with emissions reduction68.

In a previous study, we studied "mitigación" and "reducción de emisiones" in the newspapers *El País*, *El Mundo*, *La Vanguardia* and *Expansión* (Fernández-Reyes, 2018a). There we could verify that the use of the concept "reducción de emisiones" was more frequently. However, in very few articles analyzed in that study, we found both options. Therefore, the study indicates that, in the investigation of mitigation in the media, it may be interesting to include in the analysis those news that use the concept "reducción de emisiones", so that the analysis is richer and more complete.

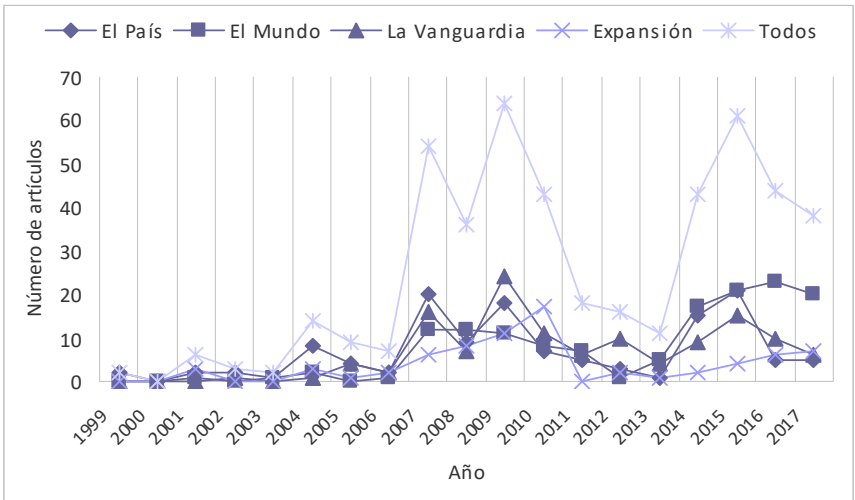

Figure 1.- Use of "mitigación" between 1999 and 2017 in news from My News (Fernández-Reyes, 2018a)

67 Glossary of Climate Change 2014, AR5 Synthesis Report, p. 125

68 In the cited study on adaptation to climate change in the Spanish press, we find numerous examples of this simplification (09/01/2012, 03/12/2015, 06/04/2015 in El Mundo, 10/29/2015, 19 / 11/2016 in El País, 09/26/2013, 10/13/2015 in Expansión). However, we do not find that the mitigation is defined completely.

In this study we observed that "reducción de emisiones" appears in 67 articles, 7% of the news, while "mitigación" appears in 27.3%. Both options are present at the same time in 5% of the news. This means, once again, that the use of "reducción de emisiones" to talk about mitigation is greater than the use of "mitigación" solely. In addition, it is interesting that in very few cases they appear together.

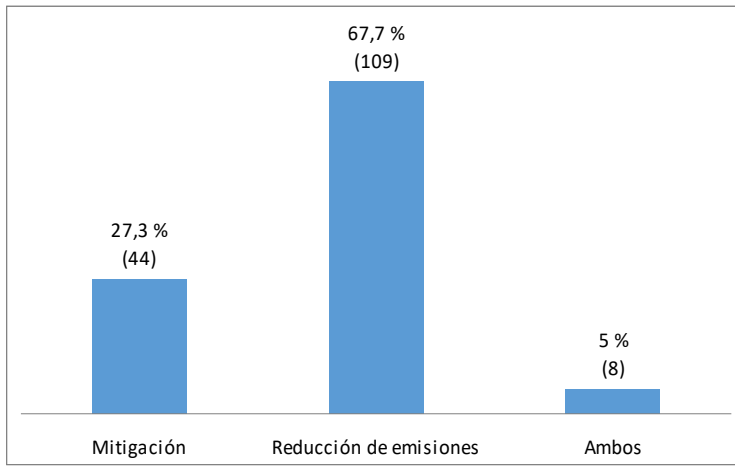

Figure 2.- Use of the concepts "mitigación" and "reducción de emisiones"

In this research we have used MyNews, offered by the Library of the Faculty of Communication at the University of Seville. MyNews is a reliable search engine, with stable performance. However, in some specific cases, it has problems to collect all the parts of the news. We have used MyNews Hemeroteca Profesional and the following search formula: "mitigación" AND ("cambio climático" OR "calentamiento global"). In addition, we conducted a second search with the formula: "reducción de emisiones" AND ("cambio climático" OR "calentamiento global"). Then, we add the result of both searches and eliminate the repeated news69. Each news item was identified with a unique number.

The study analyzes the news in the best-selling Spanish newspapers (according to OJD of February 2018): *El País* and *El Mundo*. The analyzed period covers from January 1, 2016 to December 31, 2017. A total of 161 news items were analyzed: 62 in *El País* and 99 in *El Mundo*. During the study process we think about the possibility of analyzing only the news that has used the term "mitigación" in the newspapers *El País*, *El Mundo*, *La Vanguardia* and *Expansión*. But as Figure 1 shows, only *El Mundo* published

69 Sometimes, the same news appears several times the same day, since they are published in different editions of the newspaper. In these cases, it is only counted once. If possible, the option of the General or National edition is chosen; otherwise the edition of Madrid is chosen.

more than a dozen news stories in the last two years. Due to this small number of texts, we preferred to add the concept "reducción de emisiones" in the search and reduce the number of years to investigate.

As can be seen, the media coverage of mitigation was greater in 2007, the year in which climate change emerged strongly in the media (IV IPCC Report, the documentary “An Inconvenient Truth”, Nobel to IPCC and Al Gore), in 2009, the year of the Copenhagen Summit, and in 2015, the year of the Paris Summit. If we compare these data with those offered by the Media and Climate Change Observatory (MeCCO) of the University of Colorado, which studies the monthly evolution of news that includes "climate change" and "global warming", we can verify that the coverage media on mitigation coincides in these three same main moments:

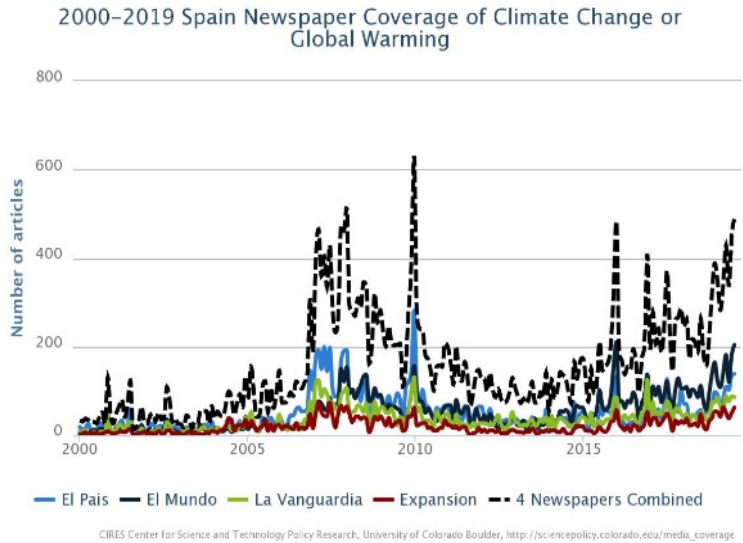

Figure 3.- Spain Newspaper Coverage of Climate Change or Global Warming (Fernández-Reyes and Jiménez-Gómez, 2019)

2.b. Classification of news according to the variables and categories previously chosen

Each analysis variable includes different categories and, in some cases, subcategories, which allow a descriptive analysis from different areas. Some categories have been used in other studies, other categories are contributions from researchers such as Piñuel (Piñuel et al, 2013) or Erviti (2014), and others are a new proposal.

Thus, the variables used are: Journals, Years, Months, Relevance, Headlines, Sections, Journalistic Genres, Authorship, Sources, Geographical

Scope, Framing, Sectors, Measures, Types of mitigation, Images, Mitigation Policies, Links with the Climate objectives and key concepts.

Table 1. Variables and categories used in the analysis

Variable	Description	Categories
Newspapers	Published newspaper	- El Mundo - El País
Years	Year in which the newspaper is published	- 2016 - 2017
Months	Month in which the newspaper is published	- January - February - March - April - May - June - July - August - September - October - November - December
Relevance	Importance of climate change mitigation and emissions reduction in the news and in the newspaper	- Global: Presence on the cover Presence on the editorial section - Particular: Primary topic Secondary topic Occasional topic
Headlines	Importance of climate change mitigation and emissions reduction in the headlines and how it is covered	- Presence of terms in the headlines - About What is said What is done What happens

Sections	Section of the newspaper where the news is located	- Meteorology - International - National - Culture - Society - Science - Cover page - Regional Edition - Economy - Opinion - Miscellaneous - Trends - Environment - Monographic - Others
Journalistic genres	Journalistic genre used in the news	- Information - Opinion - Report - Interview - Brief - Journalistic chronicle - Editorial journalistic
Authorship	Authorship of the news	- Agency - Journalist - Newspaper - Articulist - No signature / Does not appear
Sources	Scope to which the sources used in the news belong	- Policy area / Public administration - Social / citizen area, journalists / analysts, ecologists / NGOs - Economic area, - Scientific / technological / research area

Geographical scope	Place where the story is located	- Inside Local / regional Provincial Regional National - Exterior International Europe Africa North America South and Central America Asia Oceania Arctic Antarctica Generic / Difficult to contextualize / Unspecified
Framing	Type of news frame	- Scientific - Technological / Innovation - Economic - Politician - Social - Others / Difficult to frame
Sectors	Sectors with which the information is related	- Energy - Transport - Edification - Industry - AFOLU - Urban planning , infrastructures and territorial planning
Proposals	The sectors in which the mitigation and emissions reduction proposals are applied or will be applied are classified.	- Energy - Transport - Edification - Industry - AFOLU - Urban planning , infrastructures and territorial planning
Types of mitigation	Classification of mitigation according to different types	- Proactive, reactive mitigation, both, unspecified / No hint - Planned Adapt mitigation ation, Autonomous, Both, Unspecified / No hint - Individual mitigation, Collective, Both, Unspecified / No allusion - Mitigation Implicit, Explicit, Both, Unspecified / No allusion

Images	Images in the news are analyzed	- Typology Photo Figureic Table Drawing Maps-InfoFigureics Without image Could not access - Topic Impacts Causes Solutions Protests Other Without image Unable to access - Spatial identification Near Far Difficult to identify or classify Without image Could not access - Temporary identification Near Far Near and far at the same time Difficult to identify or classify Without image Could not access
Mitigation policies	Study of the different mitigation policies	- Economic incentives - Regulatory approaches - Information programs (tagged and audited) - Government contribution (exemplary) - Voluntary measures
Links with climate goals	Analysis of climate objectives	- 1.5º C - 2º C
Key concepts	Study of the presence of some key terms (through its roots) in relation to mitigation	- Vulnerability - Resilience - Carbon footprint - Decarbonization - Migrations - With adaptation or not - Climate change or global warming

2.c. Statistical analysis of results and interpretation of results

After analyzing the news from the indicated variables and categories, we used the SPSS Statistics 20 software program. With it, the frequency of these variables has been calculated using contingency tables and the results, after reducing and simplifying the information, have been represented with Figureics made using Excel 2007 software.

3. Analysis

3.1. Number of articles published by newspapers

The result obtained after the analysis in regard to the number of news that speak of "mitigación" or "reducción de emisionies" is similar to what we get looking for the terms "cambio climatic" or "calentamiengo global". *El Mundo* is the newspaper with the most news (99), followed by *El País* (62).

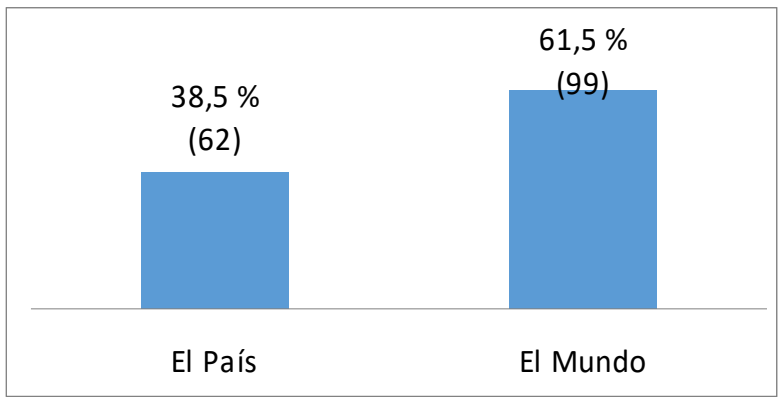

Figure 4.- News about mitigation and emissions reduction by newspapers

3.2.- News in the annual calendar

In the years 2016 and 2017 there was a growth in the number of news that include "mitigation" and "emissions reduction". This trend is similar to that obtained when analyzing news that includes "climate change" or "global warming".

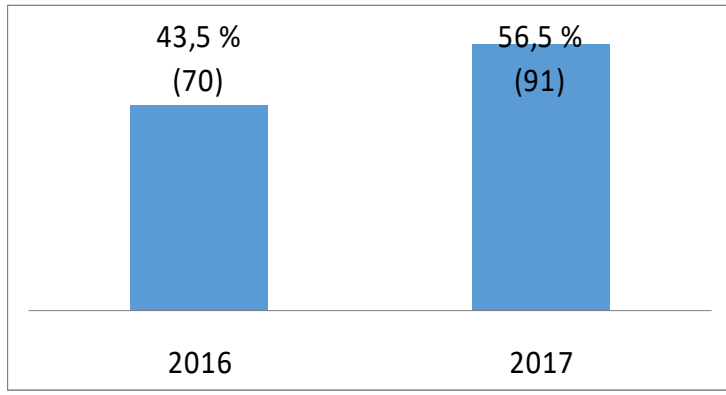

Figure 5.- News by years

The proportion of articles that contain "mitigación" or "reducción de emisiones" between news on "cambio climático" or "calentamiento global" is 3.9%, a similar figure in 2016 and 201770.

3.3. Evolution of news stories by months

After analyzing the number of news published in each month of the year, we found that November is the month with the most news (34, 21.1%), followed by June (26, 16.1%).

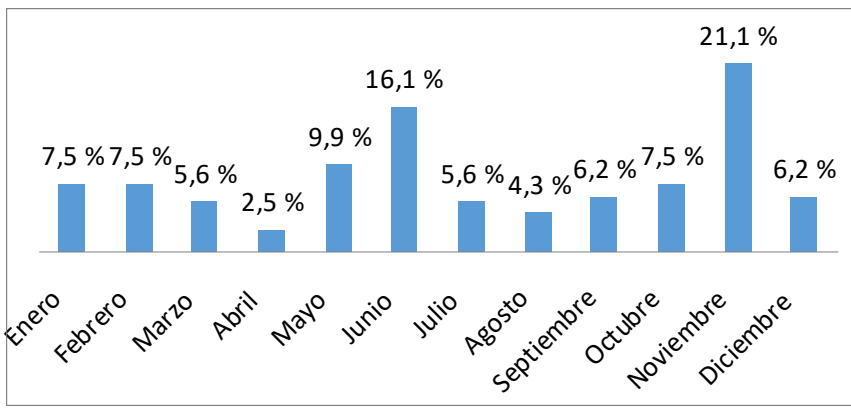

Figure 6.- News by months

70 These data have been extracted with the search engine ProQuest

3.4. Importance of mitigation and emissions reduction

3.4.1. Global

The press covers and the editorials are prominent spaces in the distribution of the information of a newspaper. In the present study we have found an article on the newspaper cover (02/06/2017) and two editorials (05/11/2016 and 29/01/2017) with the concepts studied. All of them are in *El País*, related to international politics and using "reducción de emisiones" instead of "mitigación". According to the analysis of these journalistic spaces, "reducción de emisiones" and, especially, "mitigación" have a reduced presence in *El País* and even less in *El Mundo*.

3.4.2.- Particular

To analyze the importance of mitigation and reduction of emissions within the news in which it appears, we differentiate between a leading role and when that role is shared. In addition, we understand that these concepts play a secondary role when the news focuses on adaptation rather than on mitigation. Finally, we understand that the presence is occasional when it appears as one more element. That is, it is named, but it is not given importance.

Thus, the mitigation or reduction of emissions is a priority issue in 50.3% of the news on that subject, secondary in 36.6% and occasional in 13%.

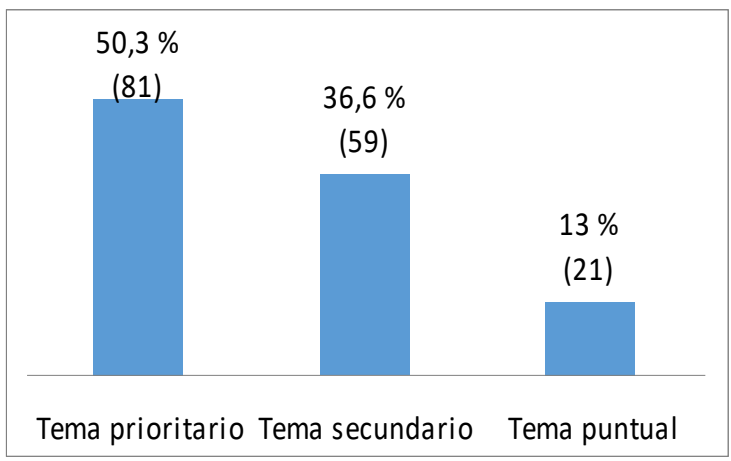

Figure 7.- News by importance of the subject

3.5. News headlines

3.5.1. Mitigation and emissions reduction in news headlines

The terms "mitigación" and "reducción de emisiones" never appear in the news headlines analyzed. Figure 1 shows a cloud with the most used words in the headlines:

Figure 1.- Word cloud based on the terms used in the news headlines

Table 2 shows the most frequent terms in the news headlines in which the mitigation or reduction of emissions are addressed are "change", "climate" and "Trump".

Table 2.- Most frequent terms in the news headlines

Term or concept	Number appearances
cambio	30
climático	29
Trump	11
Energía	8
emisiones	7
pacto	7
clima	7
Spain	6
lucha	6
CO2	6

3.5.2.- Content of news headlines

After analyzing the content of the headlines of the news we find that predominates talk about "what is said", then talk about "what is done" and, finally, "what happens." That is, the content of the headlines is linked first to the debate and then to the action. In the investigations of other authors, "what is said" also predominated (Piñuel et al., 2013, Fernández-Reyes and Aguila-Coghlan, 2015).

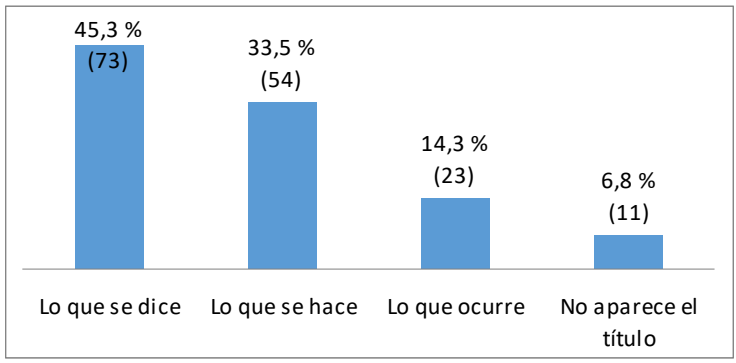

Figure 8.- News by the content of the news headlines

3.6. Newspaper sections

The criteria for the location of the news and the names of the journalistic sections are different in each newspaper. Thus, *El Mundo* usually collects this news in the regional edition, while *El País* talks about this topic in International or Economy. These results demonstrate that the mitigation and reduction of emissions are not exclusively environmental content, but are present in other sections of the newspaper.

Table 3.- News by newspaper section

Country	*El País*	*El Mundo*	Total
International	19	2	21
National	2	0	2
Society	0	2	2
Science	0	14	14
Cover page	1	0	1
Regional Edition	2	38	40
Economy	18	12	30
Opinion	7	2	9
Others	6	14	20
Environment	2	0	2
Monographic	5	3	8
Innovators	0	12	12
Total	62	99	161

3.7. Journalistic genres

The three most frequent journalistic genres in the analyzed sample are *information* (68 news, 42.2%), *report* (46, 28.6%) and *opinion* (30, 18.6%). In *El Mundo*, *information* predominates, while in *El País* there are more news with a reporting focus.

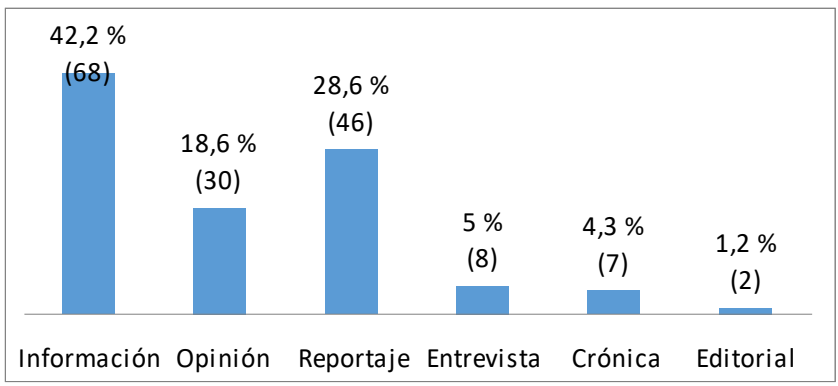

Figure 9.- News by journalistic genres

3.8. Authorship

Most of the news has been written by a journalist, while news agencies have a marginal role. These are the journalists who most appear in the analysis: Manuel Planelles with 17 news from *El País*, Miguel G. Corral with 6 news from *El Mundo* and Lidia Montes with 4 news from *El Mundo*. The role of professional journalists stands out in both newspapers. In *El País*, article writers are the second most numerous type of authorship, while in *El Mundo* it is "without a signature-it does not appear".

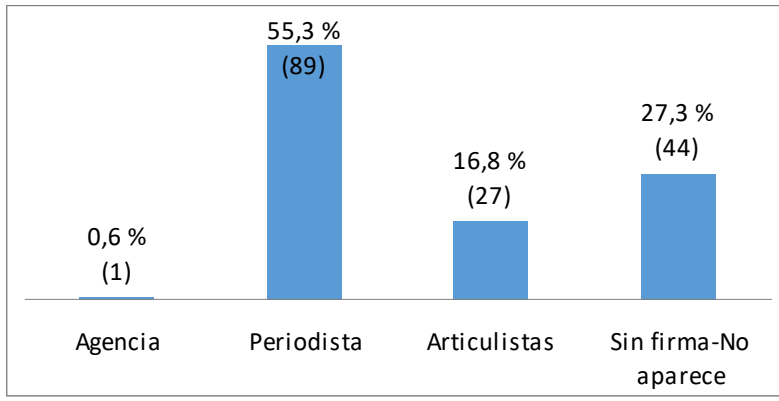

Figure 10.- News by authorship

3.9.- Informative sources

To study this variable we have compiled up to three informative sources in each news item. However, some news does not include any informative source in the results obtained. Thus, the *political-public administration* sphere is the one that most appears (59.6%), followed by the *scientific-technological-research* field (19.8%), the *economic* sphere (14.2%) and, finally, the *social* area71, with 6.2% of the total.

71 It collects citizen sources, from NGOs, journalists and analysts

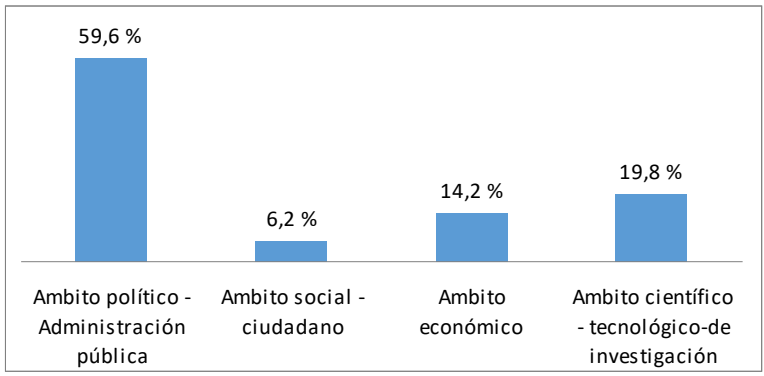

Figure 11.- News by informative sources

3.10. Geographic location

54% of the news of the study speak of outside Spain, compared to 46% that refer to Spain. As in the study on press coverage of adaptation to climate change (Fernández-Reyes, 2018b), these results are not met in *El Mundo*, where news about Spain are more frequent, with a wide range of regional and provincial editions.

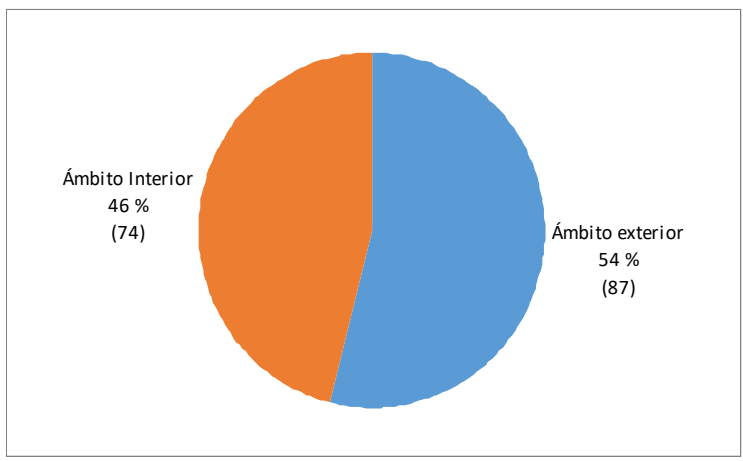

Figure 12.- News by geographical location

Among the news that refer to Spain, we observe that the national scale (Spain) is the most numerous (18.6% of the news), followed by the regional scale (14.9%). Castilla León and the Balearic Islands, linked to the regional editions of *El Mundo*, are the regions that most appear.

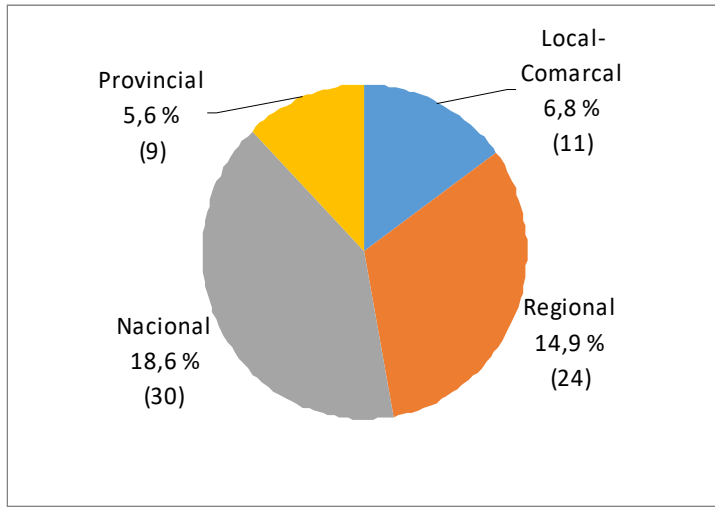

Figure 13.- News by geographic scale in Spain

Among the news that refer to outside of Spain, the international scale is the most numerous (36% of these news), followed by Europe (8.7%).

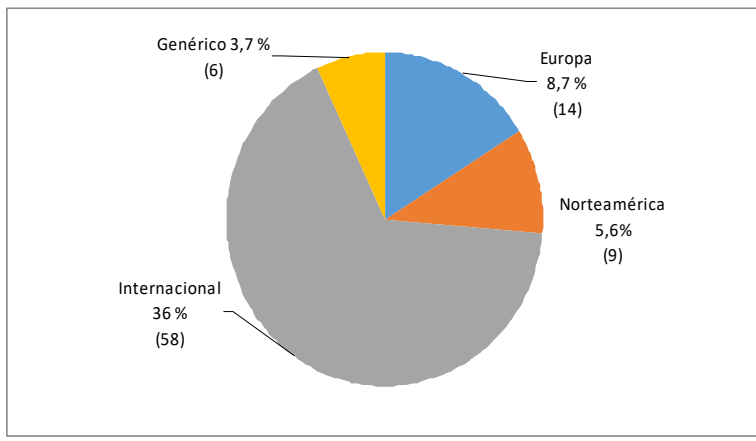

Figure 14.- News by geographic scale outside of Spain

3.11.- Framing

Title, antetitle and the subtitle of the news have been analyzed to study this category. Thus, the most frequent framing is *political* (48.4%), followed by

economic (19.9%) and *scientific* (11.8%). The *social frame* is the least weight, with only 3.1% of articles.

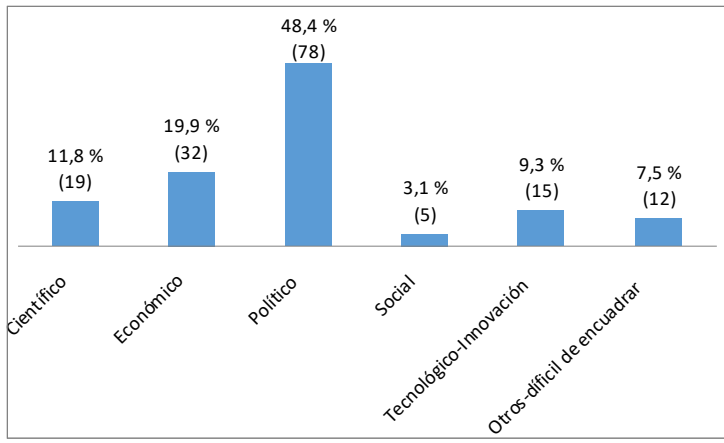

Figure 15.- News by framing

3.12.- Economic sectors

The list of sectors has been obtained from the document *Cambio Climático 2014 Mitigación del cambio climático Resumen para responsables de políticas y Resumen técnico* (p.75). After the analysis we found that 25 news do not belong to any sector. The remaining 136 articles can be linked even with 5 sectors, because many of them refer to several sectors. As a result, the energy sector has the highest presence (34.2%), followed by transport (20.8%), industry (18.2%) and AFOLU (12.3%). The options that have a smaller presence are human settlements, infrastructure and territorial planning (8.1%) and the building sector (6.1%).

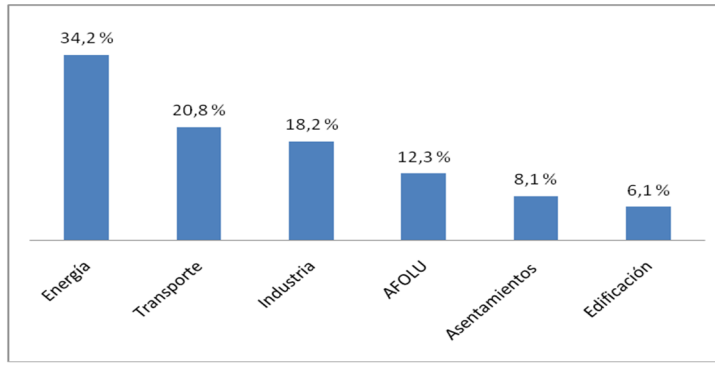

Figure 16.- News by economic sector

3.13. Proposals to be implemented

A total of 54 articles do not include any mitigation proposal. In the remaining 107, there are even two proposals per article. As a result, it is observed that the order of importance of the economic sectors is maintained. Firstly, there is energy (46%), followed by transport (21.2%), industry (12.7%), AFOLU (12.1%), human settlements (4.2%) and building (3.6%).

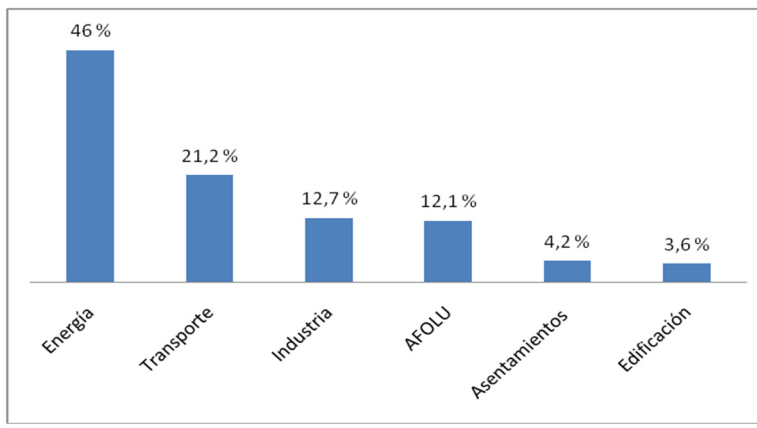

Figure 17.- News by the economic sector of the proposals

We have also analyzed the news that talks about standards and plans, where the references to the Ley de Cambio Climático y Transición Energética stand out (14 news).

3.14.- Types of Mitigation

In this section we study the first use of the concept "mitigación" or "reducción de emisiones". When these concepts are used several times, we complement the information, eliminating the repetitions. The variables studied in this category are: Proactive/Reactive, Planned/Autonomous, Individual/Collective and Implicit/Explicit. Each pair of concepts can also be linked to: Both concepts and Unspecified.

A) Proactive / Reactive

The "proactive" mitigation or reduction of emissions has an outstanding presence (78.3%) compared to the "reactive" mitigation (2.5%). The option "both" is present in 7 news (4.3%).

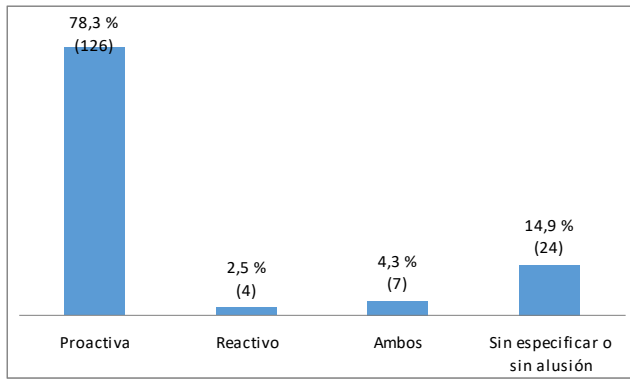

Figure 18.- News by proactive/reactive mitigation

B) Planned / Autonomous

The "planned" mitigation or reduction of emissions prevails in the news (47.2%), followed by "both" (29.2%), and of "autonomous" (11.8%).

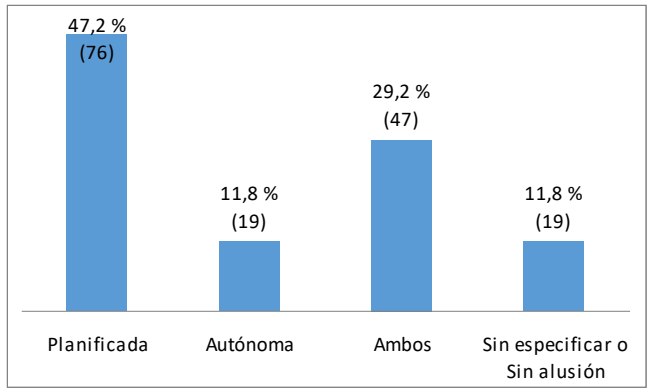

Figure 19.- News by planned/autonomous mitigation

C) Individual / Collective

The mitigation or reduction of emissions of the "collective" type is the majority, with 85.7%, compared to the "individual" adaptation, which is present at 3.7%.

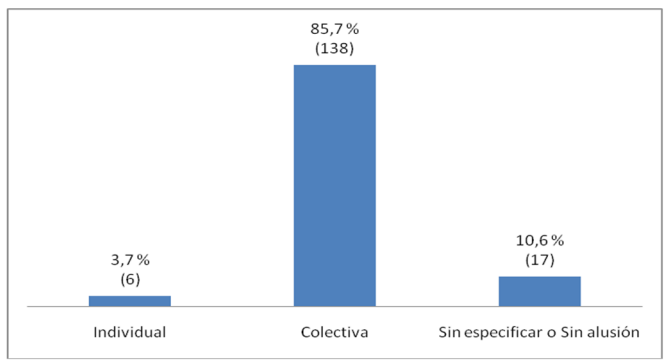

Figure 20.- News by individual/collective mitigation

D) Implicit / Explicit

In 98.8% of the news analyzed, the mitigation or reduction of emissions is "explicit", compared to 1.2% of the articles, with an "implicit" type of mitigation.

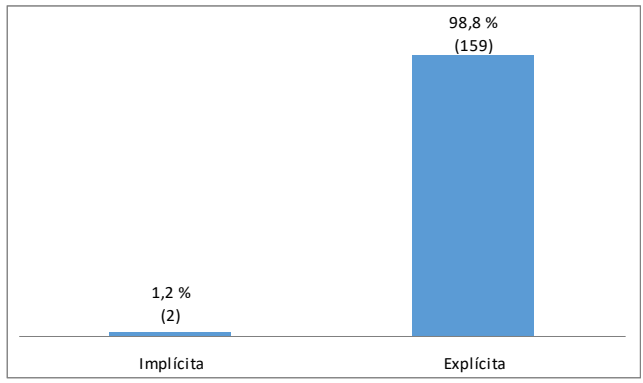

Figure 21.- News by implicit/explicit mitigation

3.15. Mitigation policies

In this section we have used the categories included in the document *Cambio Climático 2014 Mitigación del cambio climático Resumen para responsables de políticas y Resumen técnico* (p.104). Regulatory approaches are the most numerous among mitigation policies (55.8%). They are followed by economic incentives (34.3%). The rest of the categories have little presence.

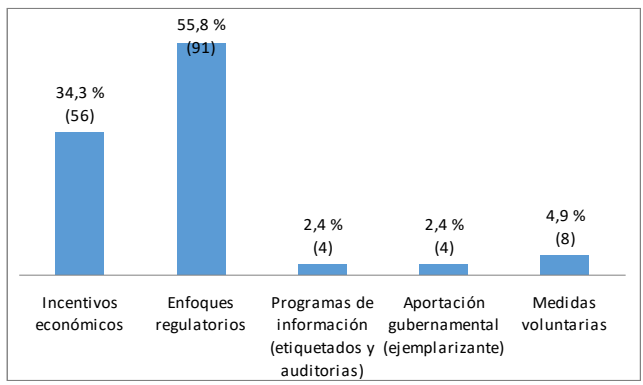

Figure 22.- News by the mitigation policy

3.16. Images

Two images have been analyzed of each news. Larger ones had priority. Since the images accompany the news, in many cases they are not images related exclusively to the mitigation or reduction of emissions. In the analysis we have used these categories and subcategories: Typology (with the

subcategories Photo, Graph, Table, Drawing, Maps-Infographics, No image or Could not be accessed), Thematic (with the subcategories Impacts, Causes, Solutions, Protests, Other, No image or Can not be accessed), Spatial location (with the subcategories Near, Far, Difficult to identify or classify, No image or Could not be accessed) and Historical time (with subcategories: Near, Far, Near and far to time, Difficult to identify or classify, No image or Could not be accessed).

A) Typology. 27.3% of the news does not include images. Among the rest, the photographic images are the most used (80.8%), at a great distance from the drawing (8.9%). Behind we find the map-infographic category (5.5%) and the graph (4.8%).

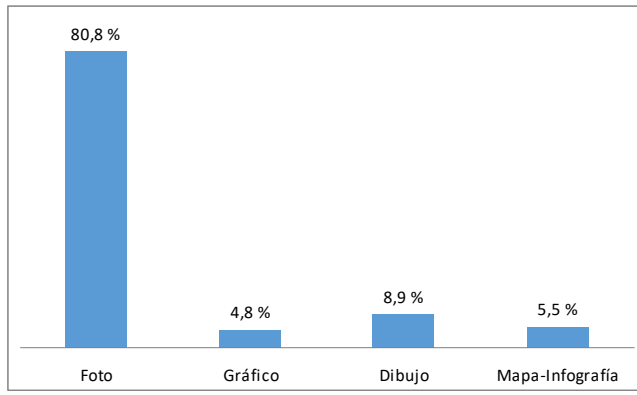

Figure 23.- News by the type of image

B) Thematic. The categories of this theme arise from the proposal of María del Carmen Erviti (2014)72. 49.7% of the news talk about solutions, followed by impacts (8.7%), causes (6.8%) and protests (3.1%).

72 The "cities" subcategory, which Professor Erviti includes in Causes, has sometimes been included in Solutions, depending on the topic that is addressed

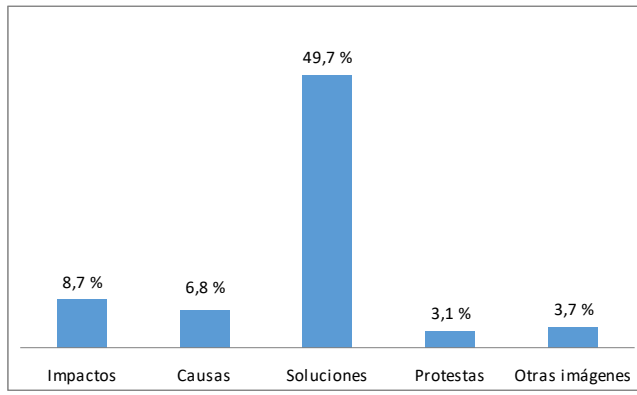

Figure 24.- News by the theme of the images

C) Spatial location. 46.2% of the analyzed images show mainly close spaces, while 38.6% show distant spaces73.

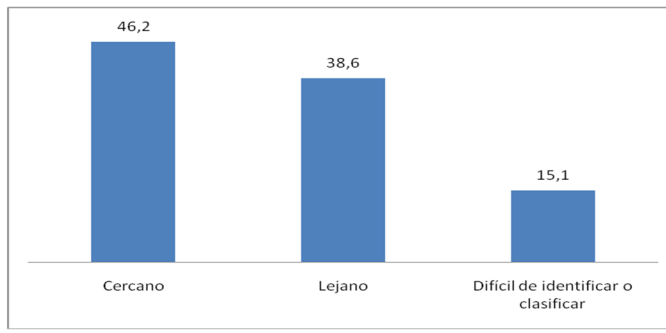

Figure 25.- News by the spatial location of the images

D) Historical time. After studying whether the images refer to a distant or close time74, we observe important differences: 88.9% of the news refer to a close time, compared to 2.7% of the news, which speak of a distant time .

73 To differentiate between proximity and spatial remoteness it has been considered that "near" means distances less than 500 kilometers approximately

74 For the temporary proximity/remoteness category, we propose as reference 5 years from the publication of the news.

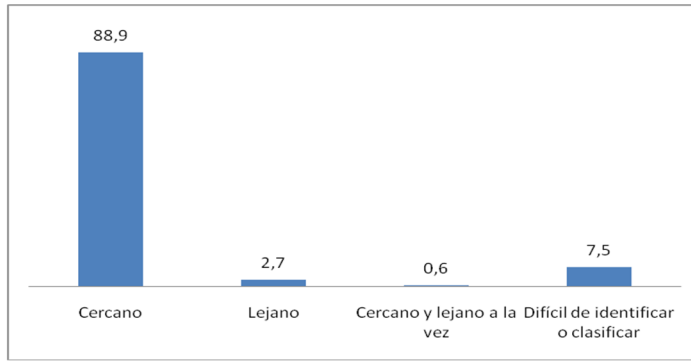

Figure 26.- News by historical time

3.17.- Relationship with climate objectives

When we study the relationship of the news with the climatic objectives, we observe that the temperature level of 2° C, expressed in different ways, is present in 21.1% of the articles.

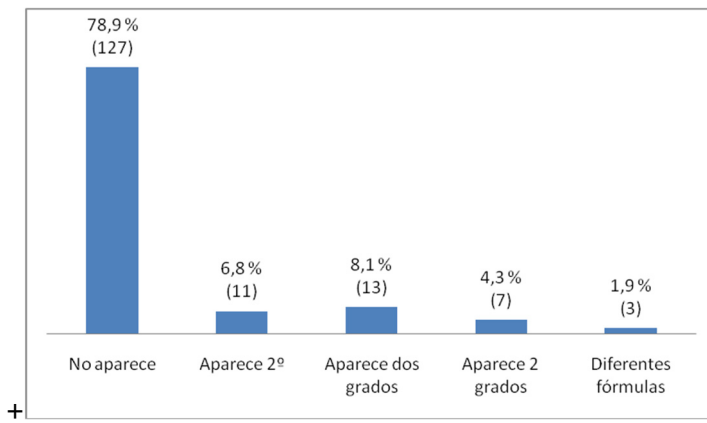

Figure 27.- The objective of 2ºC in the news

This proportion drops to 11.2% when the news refers to the climatic objective of 1.5° C.

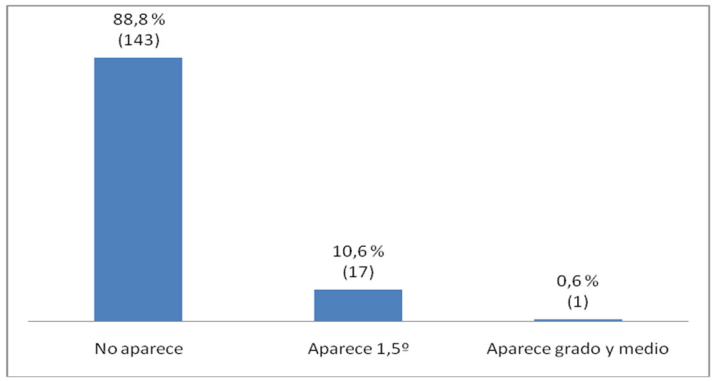

Figure 28.- The objective of 1,5ºC in the news

3.18. Key terms

The following data is the result of studying the use of some key terms in the news. For this, we have searched the news for these lexical roots: "decarboniz" appears in 11.8% of the articles. Behind we find "carbon footprint" (8.6%), "vulnerab" (8%) and "resilien" (1.8.1%). The presence of the root "migra" has also been studied, which appears in 6.8% of the articles studied.

The term "adaptación" appears in 19.9% of the news in which also appears "mitigación" or "reducción de emisiones". In all the cases analyzed, adaptation is a complementary proposal to face climate change, never an incompatible proposal.

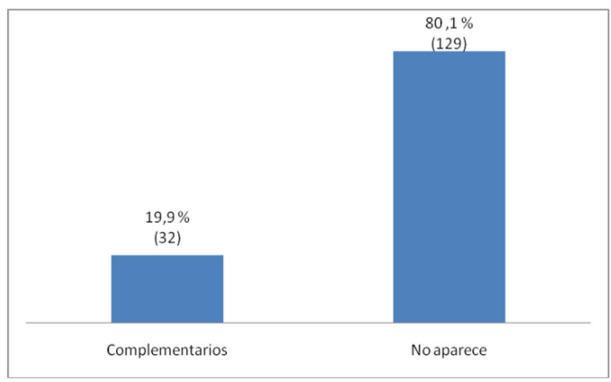

Figure 29.- The term "adaptación" in the analyzed news

65.2% of the news uses the term "cambio climático", as opposed to "cambio climático", which is used by 3.1% of the news. Both expressions appear in 24.8% of the news. 6.8% of the news includes both words, but without the term "global".

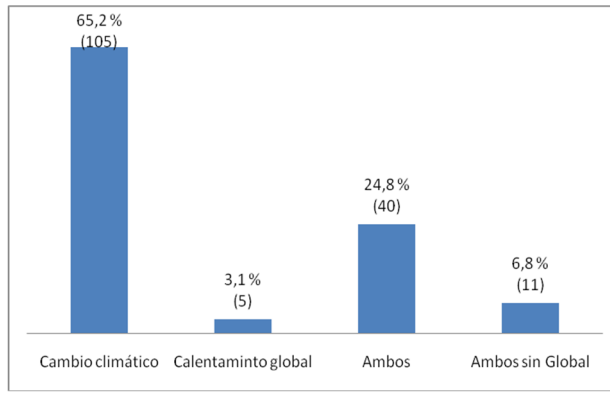

Figure 31.- "Cambio climático" and "calentamiento global" in the analyzed news

4. Conclusions

Between January 1, 2016 and December 31, 2017, *El País* and *El Mundo*, two of the main newspapers in Spain, make little use of "mitigación". In fact, the term "reducción de emisiones", although it is a part of mitigation, is used more often. In many cases, it is used as synecdoche or metonymy.

Among the 161 news analyzed in this study, *El Mundo* is the newspaper that most talks about mitigation, followed by *El País*. This result is similar to the study on the use of the terms "cambio climático" and "calentamiento global". The use of "mitigación" and "reducción de emisiones" in the news of these newspapers has been increasing in recent years, a trend that is similar in the use of "cambio climático" and "calentamiento global" in the Spanish press. In the last quarter of the year there was more news about this issue, especially in November, during the United Nations Framework Convention on Climate Change.

The mitigation and reduction of emissions do not usually appear in the most important areas of the newspapers analyzed. Only one newspaper cover and two editorials talk about this topic. However, in the news that includes "mitigación" or "reducción de emisiones", this is usually the main issue. In the headlines of the news, "what is said" predominates, followed by "what is done" and, finally, "what happens". So there is more news focused on the debate, the controversy, followed by the action. The most used

terms in newspaper headlines are, in order of relevance: "cambio", "climático", "Trump", "energía" and "emisiones". "Mitigación" and "reducción de emisiones" do not appear in any headline.

The news about mitigation and emissions reduction are located in different sections of the newspaper. In *El Mundo* it usually appears in Regional and in Science. In *El País* there is more news in International and Economy. This means that newspapers talk about mitigation and emissions reduction horizontally. In the newspapers analyzed, information stands out as a journalistic genre, followed by reporting and opinion. The authorship of the journalists is the majority among the analyzed news. The journalists who wrote the most articles are: Manuel Planelles (*El País*), Miguel G. Corral and Lidia Montes (*El Mundo*).

The political-public administration field is the journalistic source with the greatest presence among the news. Similarly, the most frequent framing of the news is the political one, followed by the economic and scientific framing. The social sphere has little presence as a journalistic source and as a frame.

On the other hand, articles located outside Spain (54% of the news) stand out, compared to 46% that refer to Spain. Thus, the international category is the most frequent. In the news referring to Spain stands out the country scale, followed by the regional scale.

The order of importance of the economic sectors coincides with the sector of the proposals. From higher to lower presence: energy, transport, industry, AFOLU, human settlements and building.

About types of mitigation, the proactive option stands out on the reactive, the planned on the autonomous, the collective on the individual and the explicit on the implicit.

About the images that accompany the text of the news, most of the images are photographs, followed by drawings, maps-infographics and graphics. In the content of the illustrations highlights the issue of solutions, followed by impacts, causes and protests. The images are usually referred to a close time and space.

The climatic objective of 2° C of temperature is more frequent in the news than the 1.5° C goal. When we study the presence of key terms in the news, we observe that the root "descarboniz" appears on many occasions, followed by others such as "carbon footprint" and "vulnerab". The roots "resilien" and "migra" appear on a few occasions.

5. Discussion

In the face of the emergency crisis described by the scientific community, the media have an essential role, as do other institutions in the political,

economic, social, or technological area. Spain is one of the countries most vulnerable to climate change, so the press cover of mitigation and adaptation there are essentials. There is a great distance, explain the results of this study, between the crisis scenario described by the scientific community and the importance given to mitigation and reduction of emissions in the Spanish press.

As the results show, the presence of the term "mitigación" in the news is very limited. It is not yet an extended concept. Although "mitigation" is more frequent than "adaptation" in the IPCC reports, its mediatic role is less (Fernández Reyes, 2014)75.

When news cover mitigation or reduction of emissions, they give priority to this topic, which is an opportunity. However, this issue has had a reduced presence in the editorials of the newspapers, the covers and the headlines of the news. Mitigation is not yet how important it should be in the media. Therefore, it is necessary that media are more interested in these issues and know the recommendations for urgent action that scientists are demanding not to increase the temperature of the climate more than 1.5° C. Therefore, it is essential that newspapers dedicate prominent spaces, such as the cover, the editorial section or the headlines, in order to better cover this issue.

Another problem is that the information of "what is said" prevails over the information of "what is done". This means that debate still predominates before action, at a time when scientists demand more attention to action.

However, it is encouraging that the report and the opinion article are the journalistic genres that most cover the mitigation and reduction of emissions, because the report is a genre with a lot of space in the newspaper and the opinion article engage with citizens. On the other hand, it should be noted that it is a subject covered transversally, in any section.

The political sphere is the most important to disseminate mitigation to face the climate change, and it is also the main form of framing, therefore, it is possible to give more visibility to the subject. However, the reduced role of the social sphere as an informative source and a frame is surprising. This means that mitigation is a "top-down" policy, little assumed by citizens. For this reason, it is necessary to promote "bottom-up" strategies so that both approaches converge as a response to climate change (Ockwell, et al, 2009, Moser and Pike, 2015)76.

75 The search in ProQuest for "mitigation" and "climate change" produces almost half of the results that the search for "adaptation" and "climate change" in El País (113 compared to 225 from 2008 to 2018) and almost a third in El Mundo (43 vs. 122 from 2008 to 2018)

76 These data are prior to citizen mobilizations for the weather, so it would be interesting to study how they have changed

In the news about mitigation, those that refer to outside of Spain prevail, therefore, it is desirable that this information is also focused on our territory.

The energy sector is also the indirect cause of emissions in other economic sectors, according to the methodology used in different studies. In some of them, the cause of emissions is heteroexclusive and in others it is not. The V Report thus orders the economic sectors according to their contribution to global emissions77: energy (35%), transport (14%), industry (30%), AFOLU (24%), human settlements and building (19%). The Spanish economic sector with the most emissions during 2017[78] was transport(26%), (26%), followed by electricity generation (21%), industrial activities (19%), agriculture (10%), residential, commercial and institutional (8%), waste (4%) and others (11%). Despite the importance of transport here, its role in the news on mitigation is limited. That is, transport is less covered by the press despite having a greater environmental impact, and this calls for reflection. In the rest of the economic sectors, there is a correlation between the role of the sector's emissions and its presence in newspapers.

The importance of the proactive option over the reactive one when reacting to climate change can be considered an opportunity. Likewise, the predominance of the planned option over the autonomous and the collective option over the individual means that the mitigation and reduction of emissions are being linked to the public and the common sphere.

About the images that accompany the news, it is positive that the images show solutions and that they speak of nearby spaces.

In addition, the use of key terms such as "decarbonization", "carbon footprint", "vulnerability" and "resilience" should be promoted in the news.

In short, before the demand of scientists for "unprecedented changes", "deep" and "fast", the communication of mitigation and reduction of emissions should also offer unprecedented changes, deep and fast... both in the media relevance as in the way of offering the information.

77 Climate change: Mitigation. Summary of the V IPCC Evaluation Report. Working Group III. Edited by the Ministry of Agriculture, Food and Environment (Biodiversity Foundation, Spanish Office of Climate Change, State Meteorology Agency, National Center for Environmental Education)

78 According to the Progress Report of the Inventory of Greenhouse Gas Emissions (GHG) corresponding to the year 2017 to be sent by the Ministry of Ecological Transition to the European Commission, in https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/sistema-espanol-de-inventario-sei-/notaresultadosavance-2017_tcm30-457778.pdf

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