



GLOBAL WARMING: BIAS ANALYSIS IN DIVERGENT STRATEGIC SCENARIOS

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ABSTRACT

Global scenarios for global warming are the subject of worldwide debate, but there is no consensus among polls, and there are two biases: while one of them presents the cause of global warming as anthropogenic (man-made), the other highlights a natural variability of the climate system. Thus, the objective of this study is making an analysis of the studies related to the proposed theme in the face of the biases of global warming in divergent strategic scenarios. As a methodology, content analysis was used, with a review of the literature of the studies carried out on the subject in question with a descriptive analysis. The findings of this study show two main biases in the face of global warming, which are the anthropogenic view and the view that the factor occurs due to natural causes. Concluded that there is no consensus among scientists about the causes of global warming, but the most cited sources point to the view of IPCC, which claims to be an anthropogenic factor. The limitation of this research is due to the low number of publications found on the subject, especially on renowned bases and especially on sources that disagree with the IPCC.

Keywords: Global warming; Scientific Thought; Strategic Scenarios.

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AQUECIMENTO GLOBAL: ANÁLISE DOS VIESES EM CENÁRIOS ESTRATÉGICOS DIVERGENTES

RESUMO

Os cenários mundiais frente ao aquecimento global são assunto de debates no mundo todo, porém, não existe um consenso entre as pesquisas, e as mesmas apresentam dois vieses: enquanto um deles apresenta a causa do aquecimento global como antropogênico (causada pelo homem), o outro destaca uma variabilidade natural do sistema climático. Assim, o objetivo deste estudo é fazer uma análise dos estudos referentes ao tema proposto frente aos vieses do aquecimento global em cenários estratégicos divergentes. Como metodologia, foi utilizada a análise de conteúdo, com revisão da literatura dos estudos realizados sobre o assunto em questão com uma análise descritiva. Os resultados deste estudo evidenciam dois vieses principais frente ao aquecimento global, sendo eles a visão antropogênica e a visão de que o fator ocorre por causas naturais. Conclui-se que não há consenso entre os cientistas sobre as causas do aquecimento global, mas, ainda assim, as fontes mais citadas apontam a visão do IPCC, que afirma se tratar de um fator antropogênico. A limitação desta pesquisa ocorre pelo baixo número de publicações encontradas acerca do assunto, especialmente em bases renomadas e principalmente sobre fontes que discordem do IPCC.

Palavras-chave: Aquecimento Global; Pensamento Científico; Cenários Estratégicos.

INTRODUCTION

The global warming is the result of the climate change that has been occurring all over the world. According to Felício (2014) and Molinon (2007), these weather events always existed, but the information were not shared because of the lack of witness and equipment that record them. Aiming that, nowadays, the number of satellites that shows the phenomenal has a higher level.

The climate changes and global warming's researchers, besides of producing scientific knowledge, they are oriented by social politician (LEITE, 2015). The author emphasizes that the climatology is between a confrontation between the ones that believes that the greenhouse effect caused by men is the responsible for the global warming and the ones that considering it a natural phenomenal.

The research's center about the global warming phenomenal, the IPCC – Painel Intergovernamental sobre Mudanças Climáticas, (in English, the Intergovernmental Panel on Climate Change) it is a scientific and politician organization, which involves scientists that have the objective of producing periodic reports about the scientific knowledge about climate and the climate changes (Leite, 2015). For the IPCC, the global warming is anthropogenic, and this statement is unquestionable. The methodology used by the institution to perform this prediction is a model of global climate, which presents a sequence of difficulties in the reality representation (MOLION, 2007).

The reports developed by the IPCC, according to Souza (2012) are used by the media as a way of spreading that the global warming is responsibility of the human action. Although the media does not show neutrality in publication, the author highlights that the organ is not exclusive of scientists, but influences the politic, which it could influences the population and benefit big companies that have sustainable products.

Corroborating, Felício (2014) emphasizes that companies with ecologic production are related to benefit with rise in price in the receipt of subsidies to the production and in the tax reduction.

The researches that face the global warming are discussing in the whole world, but there is no consensus between the researchers. It is appointed two biases caused by the global warming, which for some researchers the global warming is anthropogenic and for others, the cause is the natural variability.

Therefore, the question to this research is: What are the characteristics from the scientific studies in the theme of the global warming? With the purpose of answering the question of the research there is the objective of analyzing from the issues related to the theme proposed facing the biases of the anthropogenic global warming and the global warming cause by the natural variety in different strategic scenarios.

THEORETICAL REFERENCES

In this point it is presented the theoretical foundation about this study, more specifically about the global warming.

GLOBAL WARMING

The global warming is analyzed by two biases, which for some scientist the responsibility is one of human activities and for others the cause is the natural variabilities. In the report elaborated by the IPCC are projected extreme scenarios that are going to affect the Earth, having as the principal cause the carbon dioxide (CO₂). In addition, it is reported that it will occur extern phenomenon, as the sea level increase, migration of population, thawing and the melting of polar ice caps, reduction of natural resources and others.

The anthropogenic global warming's evidences rise in the mid of the year 1950. It gained strength in 1960, becoming an important paradigm between the scientists, the physician science's reference that start to use the common science climates' field (LEITE, 2015).

Faced by this scenario of warming rise, a concept of climate changing, the IPCC the first representative studies those changes, performing surveys to provide scientific information, techniques and socioeconomics to support the population understanding in climatic changes questions that are occurring, aiming to contribute with the reduction of it (TACHIZAWA; POZO, 2012).

The authors add that the developing countries are capable of stablishing, in their action against the global warming and reduction of the greenhouse gas emission, the clean development mechanism (CDM). In this scenario of sustainability, rise as new market demand, ecologic products that do not cause pollution.

Corroborating, Azevedo and Pedroso (2010) assert that the new demands of market with the correct ecological products brought new standards of products and a new opportunity of business, aiming also to obey the environmental legislation and therefore modify the intern process of the companies aiming the environmental preservation.

Although, to the sustainable development occur in the institutions, Dodson, Azevedo, Mohiuddin, Defavari and Abrahão (2015) affirm that the interaction between the environment, the organization and future generations it is important, because the companies' decisions are related to the natural environment and the future generations depends on this generation, in what is related to environment preservation and the development of a sustainable economic system.

In contrast to, Felício (2014) affirms that those ecologic products aim to a great income to the industry, may it profit in three factors: as the income is already embedded in the product, on the part of the government or institutions' grant and the benefits from the tax. Felício also add that the anthropogenic global warming does not go beyond a great business that aim to explore the human being, as for example, with the tax increase, it is therefore a wide fallacy.

Therefore, the causes from the global warming are not defined and there is no consensus between the scientists and researchers about the real cause of it (Da Costa Silva; De Paula, 2009)

The researches show two researcher lines by the scientist, one represented by the human activities and other by the natural variability. The research line of Molion (2007), reports that it is not proven that the greenhouse effect is responsible for the global warming. The global warming was present among 1925 and 1946, with the posterior period of cooling between 1947 and 1976, when warmed up the following years. In the period of 1999 to 2006 a cooling occurred, fact that shows that may happen a cooling on the next 15 to 20 years.

METHODOLOGY

The research map publications about the global warming genes, searching for materials that discussed all the possible biases about the theme and different strategic scenarios. First, the research was based on Scielo, Spell, Web of Science and Scopus, and as the return was low, the research was expanded to the Google Scholar base. The search words in English were “anthropogenic global warming”, “global warming”, “climate changes”,

“hoax” “, fraud” and, in Portuguese, “aquecimento global antropogênico”, “aquecimento global”, “mudanças climáticas”, “engano” and “fraude”.

It was select 23 articles, through the lecture of the abstracts. Finally, after reading the all the texts, it was include on the analysis the total of 15, that it was classify between the ones that the position was not explicit.

The investigation has base on the content analysis, with the ranking of the significance of the speech in categories (BARDIN, 2011)

RESULTS AND DISCUSSION

The literature review creates two biases about the global warming, showed in the scientific researched articles. The Box 1 shows the results from the researches that point the global warming as anthropogenic, in other words, as human responsibility.

Authors and years of publication	Title	Theme
Cook, et al. (2016).	Consensus on consensus: a synthesis of consensus estimates on human-caused global warming (http://iopscience.iop.org/article/10.1088/1748-9326/11/4/048002/pdf).	They analyzed abstracts from scientific researches about the global warming theme to verify what the researchers point to be the cause of it. The result shows that 90% of the researchers point that cause is anthropogenic
Leite (2015)	Controversy in the climatology: The IPCC and the anthropogenic global warming (http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1678-31662015000300643&lang=pt).	It reports that the global warming is anthropogenic and that the researches from the IPCC proves that fact, highlighting that the controversies are create by the industries with politicians help, aiming to disqualify the scientific researchers. (This research makes part from the research viable by the post-doctorate scholarship of the Fapesp).
Carneiro e Toniolo (2012)	The “hot” Earth in the press: the veracity news about the global warming (http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-59702012000200002&lang=pt).	Compare the veracity of 676 news published between October from 2007 and October from 2008 about the global warming. From these, it was exception from the consensus that the causes are anthropogenic, only 1,03%.
Raybaud, Bacha, Amara e Beaugrand (2017)	Forecasting climate-driven changes in the geographical range of the European anchovy (<i>Engraulis encrasicolus</i>). (https://academic.oup.com/icesjms/article-abstract/74/5/1288/2997453/Forecasting-climate-driven-changes-in-the?redirectedFrom=fulltext).	Case study. Shows how the temperatures’ change of the sea affect the distribution of the European achovie. It also shows that others anthropogenic researches can influence the distribution, for example, pollution, ocean acidification or introduction to exotic species.
Tachizawa e Pozo (2012)	Management model for the development of software applied to	Shows that because of the global warming (anthropogenic) it will be the necessity of

Authors and years of publication	Title	Theme
	business sustainability in the context of global climate changes (http://www.spell.org.br/documentos/vol/6938/management-model-for-the-development-of-software-applied-to-business-sustainability-in-the-context-of-global-climate-changes).	changing between the relation of the government and the companies. It proposes that the companies that performed on the same sector be allied on behalf of finding alternatives to minimize the global climate changes
Bance (2015)	Public Enterprises And Production Of Global Public Goods: The Effectiveness Of Internalizing Public Missions In Relation To Climate Issues. (http://onlinelibrary.wiley.com/doi/10.1111/apce.12100/full).	It considers that the global warming anthropogenic. Based on the affirmation imposed by the IPCC. Approach the public missions in relation to the companies and the necessity of supporting it to the gradual reduction of the greenhouse gases.

Box 1: Anthropogenic Global Warming
Source: Developed by the authors (2017).

The scientific studies, according to Cook et al. (2016), shows that the global warming causes are anthropogenic, 90% - 100% from the scientific publishing presented a consensus in this affirmation. It affirms that exist a consensus in what is related to the capacity of recognize the attempts to minimize the global warming are important to aware the population.

Following the same line of research, Leite (2015) points that the global warming is anthropogenic. In his line he highlights that the discussion from the anthropogenic point of views of the climatologists it is finished. He also adds that the studies point that the global warming is anthropogenic and the opposite is not rise by scientific controversies, but by the big companies, mostly by tobacco industry.

The author describes that the researches about the climate do not attend the media and the politic before the market, which demands a certain to act. The climate is complex and what the Science can show are trends and scenarios.

The study of Carneiro and Toniolo (2012) is worried about the reliability from the news about the global warming. This study fits as anthropogenic because of the results from the research. Among 677 news that was about the object of the study, only 1,03% were exceptions of the consensus that it is an anthropogenic factor, in other words, it is very small the reference quantity.

However, the problem was widely discussed; still it was not hit a consensus about the assumption. People worry about what is spread on the media about the theme, affirming the consequences that the climate to be in the future, significantly hotter than the usual. The subject “anthropogenic global warming” shows as frequently on the media that

many people start to believe that it is a threatening and inevitable reality, but rarely dissonant subjects are published (CARNEIRO; TONIOLO, 2012).

The authors mentioned on the paragraph before point that, sometimes, “it is hide the mistakes on the scientific issues, it is avoided considerations and predictions questions. The reader who limited to these groups of communication will have no access to a reach discussing” (CARNEIRO; TONIOLO, 2012, p. 385).

The scientific consensus about the global warming is originated from the IPCC. Therefore, the academic world and business research, approach criticism about this consensus. This critical are treat as “skeptical” and revel “a dangerous redundant argument, which works as the following way: “the IPCC is the only authority that can express bout the subject which the power was assigned by the own IPCC...” (CARNEIRO; TONIOLO, 2012, p. 384).

Studies of case also contemplate the sample of this research and, by means of the data presented here, it is implicit the position that assumes the relation to the global warming. Raybaud et al. (2017), studies the climate changes of the sea that affect the distribution of European anchovies and through the projections made, predict in a long term, a scenario “pessimist to the anchovies fishing from Mediterraneo and Africa”.

The basic data used to project the scenario of distribution of anchovies originated from the IPCC, in other words, accept the line stated by it. “Others anthropogenic pressions also can affect the population of anchovies (for example, pollution, acidification of the sea, or introduction of exotic species), which could lead to unexpected results to the future” (RAYBAUD et al., 2017, p. 10). That affirmative points the positions from the authors.

Tachizawa and Pozo (2012) show that the institutional interaction between the governments and companies, possible changes drastically because of the climate changes. Companies, which demands for their operation's higher levels of energy, causing social and environmental impacts must include sustainable alternative energies sources. The authors propose that the companies also made part from the same economic sector and produce similar social impacts to work together to find a common solution about the global climates change.

Considering that the study of Tachizawa and Pozo (2012) point that the companies' pursuit common solutions; implicitly, it is understood that the climate changes it is related to the man actions. Following this line, follow the study of Bance (2015), that approach the necessity of governmental incentive.

Bance (2015, p. 705) made part from the consensus that the “global warming it is mostly cause because of the humanity”, tax by the IPCC in the middle of 2000. “The equation of Ehrlich (I = PAT) identify, in fact, three factors of possible impacts by the human pression about the environment: population, average level of consume, technology. And the technology is the factor with a great impact of a short and long term” (BANCE, 2015, p. 706).

The author affirms that the cumulative impacts, caused by the activities of the companies will have a stronger global impact. Therefore, it is necessary that to the implementation of the programs of contingency to the gradual reduction of greenhouse gases to be easily, being necessary to introduce mechanism of market, financial incentive to the companies, fact that evolves monetary and fiscal politics.

The Box 2 presents the studies that defends that the global warming does not occur effectively by consequence of the humanity, but also came from a set of all that occur in the universe, the variability from the nature.

Authors and year of publication	Title	Theme
Molion (2007)	Demystifying the global warming (http://www.icat.ufal.br/laboratorio/clima/data/uploads/pdf/molion_desmist.pdf).	It highlights that the climate of the planet came of a set of all that occur in the universe and not only the humanity is responsible.
Spencer (2007)	An inconvenient truth: blurring the lines between science and science fiction (https://link.springer.com/article/10.1007/s10708-008-9129-9).	The author reports the information presented in the movie of Al Gore. It highlights that the warming is not totally anthropogenic and that exist natural inferences.
Kosolosky (2015)	“Peer Review is Melting Our Glaciers”: What Led the Intergovernmental Panel on Climate Change (IPCC) to Go Astray? (https://link.springer.com/article/10.1007/s10838-015-9303-y)	It questioned the mistakes from the IPCC’s reports, putting in doubt the integrity of the material published by the organization. It suggests that there are personal and politics interests behind of the appeal of the anthropogenic global warming disseminated by the IPCC.
Allchin (2015)	Global WarminG: Scam, Fraud, or Hoax? (http://abt.ucpress.edu/content/77/4/39)	It analyses if the global warming is about a farce or a mistake. It relates those intentions to the reflections party that coordinate the IPCC.
Bachram (2004)	Climate fraud and carbon colonialism: the new trade in greenhouse gases. (http://www.tandfonline.com/doi/abs/10.1080/1045575042000287299?journalCode=rcns20).	It deals with climate’s fraud the “new market of greenhouse gases”

Box 2: Global Warming, Natural Variability

Source: Developed by the authors (2017).

The climate changes are presented by Molion (2007) as a set of universes occurrence. The temperature from the year 1944 it was already higher than it is nowadays, he highlights that there is not confirmation that the CO₂ is originated from the human's activities and that the natural variability from the climate does not allow to affirm that the global warming is resulting from the greenhouse.

However, there is no evidence that the global warming is caused by that the humans' activities, what does not justify the environment negligence, because considering the population growth it is very important to the environment conservation and the behaviors changes so the humanity can survive (Molion, 2007).

The previous information from Al Gore movie, *The Inconvenient Truth* presents the range events, such as hurricanes, tornados and the rising level of the sea that can be intensifying with the global warming, and these are describe as a human influence cause (Spencer, 2007). However, the author highlights that the global warming is not the entire fault from the human's activities, but it is caused by a several natural and anthropogenic factors. He emphasizes that the scientists have no idea about how much from the recent warming it is caused by natural factors or resulting of the human activities.

Between the articles found to this study, two approach doubts in relation to the consensus imposed by the IPCC that the global warming is anthropogenic. One mistake on the fourth evaluations report (2007) from the IPCC, that predicts wrongly the disappearance of the glaciers from the Himalayan in 2035, make room for the questions about the “authority, honesty and rigor of the IPCC as a leader institutions of the climate changes and correspondingly raise questions if the global warming is nothing more than a farce presented by the environmentalists” (KOSOLOSKY, 2015, p. 01).

Kosolosky (2015) points that may exist personal and governmental interest that induct the decisions published by the IPCC. Allchin (2015, p. 311) corroborate that exist party tendencies from the IPCC, affirming that the organ “is manage by a group of a party reflection, the Heartland Institute (<http://www.nipccreport.org>). It is a fake Science trying to hit credibility between the not informed and less informed”. He also adds that the alternative strategy is used to denigrate the credentials to researchers that present undesirable in what is related to the climate changes.

The study from Bachram (2004) critics the “emissions trading”, point that it is a mechanism to the legalization of the greenhouse gases emissions. The arrangements involve

an atmosphere and establish the buy and sell routine of ‘polluting license’ as they were as any other international commodities. The author linked the fact to the intention of the government and companies create an illusion to act about the climate changes and end up as reinforcing the actual an unequal power.

The author points that create an ecologic crisis have being a way of reinventing and project new market opportunities. “This new market brought with it all the inequality: incorporated that other commodities market prosper” (BACHRAM, 2004, p. 20)

The Box 1 and 2 present biases of scientific studies that describe the anthropogenic global warming and the natural variability, pointing different strategy scenarios, but some studies do not point some definition of what the real cause is. Therefore, the Box 3 catalogues the authors that present impartiality in their studies. The authors handle with the theme raising two possible biases caused by the global warming, but they do not take a side to any of them.

Authors and year of the publication	Title	Theme
Casagrande, Silva Júnior e Mendonça (2011)	Climate changes and global warming: controversies, uncertainty and the scientific publish. (http://revistas.ufpr.br/revistaabclima/article/view/25793).	It approaches the controversies and scientific uncertainty about two global warming in two magazines.
Oppenheimer (2005)	Defining Dangerous Anthropogenic Interference- The Role of Science, the Limits of Science. (http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.2005.00687.x/full).	Describe the consideration of period, uncertainty and safety difficult a definition from the natural Science. It adds that the answers to some scientific topics are less precise in decay deadlines.
Hamilton, Hartler, Lemcke-Stampone, Moore, e Safford (2015).	Tracking public beliefs about anthropogenic climate change. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0138208).	It has made a research with the population to show the public acceptance who believes that the global warming is caused by human activities.
Costa Silva, De Paula (2009)	Global warming cause: Anthropogenic versus natural. (http://ppegeo.igc.usp.br/index.php/TED/article/view/8365/7636)	It affirms that there is no consensus between the scientists about the real cause of the global warming and if it happens would be easier to prognosticate the climate from future.

Box 3: Study about the Global Warming - Impartiality
Source: Developed by the authors (2017).

By means of contents analysis from two magazines, Casagrande et al. (2011) identifies that two lines were approached, anthropogenic and natural does not deny the climate changes, for both is perfectly acceptable that it does happen, or that it may happen because of the higher concentration of greenhouse gases, the global warming. Therefore, the tests are not clear yet.

In the texts analyzed, the literature more mistaken about the climate changes are related to the IPCC. Therefore, it was noted a reduced number of articles that consider a climate change about a natural process (Casagrande et al., 2011).

Oppenheimer (2005) approach that the worry must be about what group of people or natural system will be more affected and that must substantiate the decision about what compose a dangerous climate change, in order to evaluate the formal and informal evaluations of risk. Because of this worry, he points that “the climate changes are tormented by the uncertainty about the probably of some impact, and even about the magnitude of the significance” (OPPENHEIMER, 2005, p. 1400)

Hamilton et al. (2015), in his study made a research about the population with the purpose of verifying what they consider to be the global warming responsible. The results pointed by the population shows that 53% of the interviewed considering the human responsibility. They also add that most of the searched consider having knowledge about the theme, even though they opinion may came from the politics and not from scientific research.

The differences cause of the global warming are discussed by Da Costa Silva and De Paula (2009), showing that the responsibility may not be human, but that there is not a consensus between the scientists about the real cause. They conclude that the climate changes do not affect just the environment, but also economic and social sectors. Perhaps when they have more clarity about what is causing the warming, if it is natural or anthropogenic, it will be possible to do a better prediction with a more certainty about the future climate.

FINAL COSIDERANTIONS

It was possible to identify, by means of the publication analyzed and responding the questions of the research what characteristics from the study in global warming theme, which is a relevant and controversial theme. The biggest part from the publications analyzed shows that more than 90% of the studies about the subject say that the global warming cause is

anthropogenic; this is the “official version” to the question, most because it is defended by the IPCC.

Therefore, the most part from the studies shows that the human actions are responsible for the global warming, because of it the appeal for those actions that avoid damage actions or that aim to repair damages already caused must be constant and cover all the areas, as politics, corporate or personal.

Although the skeptics, in other words, the ones that does not agree with the IPCC vision, that represent low and irrelevant before the studies, point mistakes from the IPCC, which do the effectiveness and integrity from the reports to be questioned. Some studies defend personal and governmental interests that even finance researches related to the IPCC, may reinforce the advantage of some parties.

The skeptics try, not always have success, to do their opinion to be understood, in a way that they do not believe in the anthropogenic view, but besides of it they are not against the environment care. They try to show the farce imposed by the anthropocentrism about the global warming, defending that the warming is derive from natural causes.

The limitation of these researches caused by the low number of publications found about the subject, especially with known bases and sources that go against the IPCC. Future studies may try to understand why it is hard to find publications about the theme in base of research.

Science must be the key to direct sustainable politics, but the facts must guide the analyzed and do not permit that the trend, marketing or even ideology take part about the climate changes. More attention about the facts and less about the fallacious logic.

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