CLIMATE CHANGES, UNCERTAINTIES AND CONTRADICTIONS: TOWARD THE RESPONSIBLE ATTITUDE BEFORE ENVIRONMENT

MUDANÇAS CLIMÁTICAS, INCERTEZAS E CONTRADIÇÕES: RUMO A UMA ATITUDE RESPONSÁVEL FACE AO MEIO AMBIENTE

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ABSTRACT

The theme of climate changes/modifications refers directly to global warming. For its part, it is significant the controversy between supporters and critics of the anthropic/anthropogenic approach. So, the issue of global warming and climate changes, if seen just because of human action, shows a pseudo-ideological bias, deeply marked by the ecofundamentalism and by a hulking ecofatalism, in order to conceal/hide the real root of the issue. The planet would already have gone through transformations of climatic order before the Industrial Revolution in the 18th and 19th centuries. So, setting the effective causes of climate changes/modifications involves more doubts than certainties, with climate and environmental optics and the geological approach to have important contributions to study/analyse the climate chan ges/modifications, contextualizing framing them under the paradigm shift in energy and environmental terms. Meanwhile, there is also to consider the geopolitical/geo-strategic issues and the guidelines presented by the central-organic countries and by developing nations, then gaining strength the construction of sustainable energy matrix.

Keywords: Climate Changes, Environment, Global Warming, Paradigms, Sustainability.

RESUMO

O tema das mudanças/alterações climáticas remete-se diretamente ao aquecimento global. Por seu lado, é significativa a polêmica existente entre os

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partidários e críticos do *approach* antrópico/antropogênico. Logo, a questão do aquecimento global e das mudanças climáticas, se vista apenas em razão da ação humana, mostra um viés pseudo-ideológico, profundamente marcado pelo ecofundamentalismo e por um ecofatalismo desmedido, de modo a escamotear/ocultar a verdadeira raiz da questão. O planeta já teria passado por transformações de ordem climática bem antes da Revolução Industrial nos séculos XVIII e XIX. Assim, definir as causas efetivas das mudanças/alterações climáticas, envolve mais dúvidas do que certezas, com a ótica climático-ambiental e a abordagem geológica a ter importantes contributos para estudar/analisar as mudanças/alterações climáticas, contextualizando-as e as enquadrando no âmbito da mudança paradigmática em termos energético-ambientais. Entrementes, há também a considerar as questões de ordem geopolítica/geo-estratégica e as distintas pautas apresentadas pelos países orgânico-centrais e pelas nações em desenvolvimento, aí ganhando força a construção da matriz energética sustentável.

Palavras-Chave: Mudanças Climáticas, Meio Ambiente, Aquecimento Global, Paradigmas, Sustentabilidade.

INTRODUCTION

Much has been writen about global warming caused by human action. In fact, that issue assumes methodological-scientific, conceptual and even civilizations model outlines. Indeed, such issue implies profoundly and in several orders(environmental, economical, political and social), which results in an intense argument among intervernors. However, generally, some basic matters are ignored, namely: the perspective of past cliamte changes, the geological time issue and the scientific uncertainties. The fact is that climates ranges/changes naturally and these changes are part of planet´s natural dynamics, being required to species´ evolution. Global warming provoked by greenhouse gases´ emission, known by the acronym GEE - CO2, CFC, methano gas (CH4), etc. – is one of the more notorious issues of scientific-academic and technical-political argument. The center of the debate is the bipolarization between those who ascribe the likely global warming to industrial activity and those who see problems in proceeding with emissions. Here distinct agents like Intergovernmental Panel of Climate Change (IPCC, English acronym).

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CLIMATE CHANGES: CERTAINTIES AND DOUBTS

As cited by Eerola (2003, p. 2), climate changes´ issue would not only be reduced to the anthropic/anthropogenic component, that is, emissions which have been occuring since the Industrial Revolution and that have worsened with the diffusion of industrialization supported by fossil fuels (coal, oil and natural gas), with the gas row constituted of less impactful component in the energetic-fossil base. In fact, climate changes would also present causes which could be called naturals, , since would be originated from aspects related to the planet evolution itself. In this sense, some elements generally forgotten should be considered by the debate in its regarding, as the perspective of the geological time and the past global changes, arguing alsoabout the scientific uncertainties which regard that issue. Actually, it seems impreciso or even undefined to point to an exact our approximate value in regard to the level of participation of the anthropic/anthropogenic and natural causes at the level of the climate changes, which not rarely leads to unappropriate dealing of the issue and to the imprisonment of the discussions within hyped, brief and very little (or not) scientific arguments.

Evoking Eerola (2003, p. 2), it is observed that relatively recent events ocurred in diverse parts fo the globe which involve heavy rains, floods, landslides/disasters, long periods of drought (compromising the hydroelectric generation and agricultural production) and downhill/sudden temperature rises, feed the debate about its real meaning, in general pointing to three possibilities, namely: manifestations of climate changes caused by man; symptoms of phenomena already forecast for (such as El Niño, for example) or natural cyclical variations. On the other hand, the climate and/or geological analyses evoke historical climate variationes or even geological changes. From these, its is noticed that Brazil, a hot/mild weather country, was already covered by glaciers.On the other hand, it must be registered that the current climate instabilityis nothing when compared to past changes.Indeed,short term changes (days, weeks, months, years, decades or even centuries)would be nothing but minor peaks in the context of longer periods of geological time. This means that there will be a future climate changes regardless anthropic/anthropogenic action.

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Thus,according to Eerola (2003, pp. 3 and 4), the geological view has an importante role to develop at the level of arguments on climate changes, once, geology would occupy a key position in the context of the debate on these issues.The geology is related directly with the discovery of fossil fuels and studying changes on the planet, since the events there occurred were recorded in sedimentary rock layers, over millions/billions of years, that are read/interpreted by geological studies. This leads to the enlargement of the temporal perspective with regard to the processing of climate changes and the adoption of methodological finite dynamic evolutive view in relation to the environment; the landscape and climate, which will changes with regard to the current framework, as well as modified in relation to the past. Actually, nature is constantly changing, with changes/transformations occuring slowly due to time perception of humanity. The geological processes evolve in a gradient that goes from catastrophic processes to consequences, with climate changes emerging here as an example. Actually, without the occurrence of these changes would not be possible the evolution of life itself, since the same are necessary for the process of evolution of the species. On the other hand, the geological knowledge can contribute in order to stay the eco catastrophic view and the eco fundamelntalist appeal with regard to the approach of climate changes, in order to anchor the discussion within a more technical-scientific base.

According to Eerola (2003, pp. 5 and 6), the climate changes are normal with respect to the behavior of the planet and its main causes are geological, result of continents drift, mainly the formation/fragmentation of supercontinents, caused by the movement of tectonic plates. This leads to the formation of mountain ranges, which, in turn, may prevent access to hot weather currents from one region to another, and the mountainous areas generate alpine glaciers to have a cooling effect at the level of atmosphere. In addition, it is recorded that most of the ice ages occurred at times when the continents formed large agglomerations. On the other hand, the climate is also influenced by the chemical composition of the atmosphere, especially the content of GEE. Actually, the GEE are a species of of coverage around the planet, which prevents the leakage of heat towards the space. With the increase of the

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quantity of CH4 and CO2 in the atmosphere, the temperature registers climbs (heating). However, when large amounts of CO2 are removed from the atmosphere and dissolved in the oceans (burial of organic matter and carbon sediments in lakes, wetlands and seas) there is the decrease of temperature (cooling). Finally, climate changes can also occur through changes in vegetation, weathering of rocks, volcanic eruptions, changes in the Earth's rotation and variations in incidence of solar radiation, in addition to other still unknown factors.

As highlighted by Eerola (2003, pp. 6 and 7), it is possible simulatethe past climatesand forecast on future climates.In that sense,the climate-estimated exercises would be showing a highly worrying situation.According to the IPCC,it seems clear that GHG improvement in atmosphere appears as result from human action and emerges as cause of global warming.Such diagnosiswould lead to the outline and deployment of measures assigned to the reduction of the emissions of these gases. However, the simulations which support the anthropic/anthropogenic argument would be based on pressumptions, since all factors/interactions that influence the climate are not known. Indeed, there are several scientific uncertainties on the real elements which motivate the current climate changes experienced by the planet. However, for many members of the scientific community the uncertainties would be centered mainly on the theses of anthropic, global, climate theses. Actually, there is not certainty on several significant aspects like the water steam role (assessed unapropriately by most of the works), clouds and vegetation in carbon cycle, as well as heat dissipation and and solar radiation reflection. These uncertainties would lead to significant gaps in terms of knowledge on planet, being enormous challenges to the geosciences. On the other hand, the temporal universe adopted by studies/reports from IPCC (approximatelly one century) covers part of the industrial period, which is minimal under geological point of view, since the lastice age (prior to current period) ended ten thousand years ago and the new must occur in 23 thousand years.

As recorded by Eerola (2003, pp. 6 and 7), this means that in a interglacial period, cyclical oscillations at the level of the temperatures (between the higher

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and lower) are registered. However,the rise of average temperature and CO2 content, which leads to anthropic/anthropogenic design is registered. In fact, the amount of CO2 would suffer an increase never before disclosed, leading to levels not recorded in recent history of the planet, which would demonstrate that the current moment reveals the occurrence of something extremely unusual, despite evidence that the rise registered in CO2 emissions should not just be due to human activity. There is also a strong correlation between other CO2 sources (oceans and volcanic activity, for example) and the rise in global temperature. However, despite all these considerations about scientific uncertainty concerning the anthropic/anthropogenic of CO2 emissions and its rise, it is undeniable that the action of man (industry, deforestation and desertification) brings its nothing insignificant contribution for its occurence, in addition to also increase the amount of other GHGs into the atmosphere, which shows in terms of global warming, much more effectiveness than the actual CO2. Therefore, using Eerola (2003, pp. 6 and 7), it must be recorded that the CFC is produced only by man, rice cultivation and cattle breeding increases the concentration of CH4, automobile traffic grows the concentration of ozone (O3), while the use of fertilizers and the manufacture of nylon increment the production of oxides of oxygen. On the other hand, human actions, although they may be regarded as insignificant in the context of a global perspective and also before the geological time, when taken in conjunction with other atmospheric agents, can assume dimensions of great significance. There is also to point out that the geological processes are slow when compared to action/influence of man. This, despite the fact that occur within a relatively short period of geological time, cumulative effects/generally more intense sudden than those of natural agents, characterized by a relatively slowness. Before these aspects, there is a great uncertainty about the causes of global warming, namely: anthropic/anthropogenic or the result of a natural increase of temperature realted to an interglacial period? The situation could evolve from uncertainty to the threat. The threats may endure for decades and climate change to be initiated hardly can be interrupted, with the real possibility that if we pass to a period of greenhouse effect not gradually but sudden, with possibly catastrophic consequences for the environment and humanity.

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ENERGETIC ENVIRONMENTAL PARADIGMS

More than consider the existence of an energy paradigm, must first take into account the presence of an energy-environmental paradigm, once the energy issue and the environment are not only closely linked together, but also by the fact of recognizing the existence of systemic-interactive relationships between energy and environment. Thus, in the midst of the Industrial Revolution, which took place in England between the 18th and 19th centuries, the paradigm of fossil fuels, primarily coal-based and, later, especially after the second world war, taking up the oil as energetic leader, was configured. This paradigm was based on a *modus operandi* of high level energy greedy with deep impacts on the environment.

The occurrence of the oil shocks of 1973 and 1979 begins to show the weaknesses and evil aspects of petro-energitismo that characterize the paradigm of fossil fuels. From there, begins a process of transition to a new energy paradigm, namely: the paradigm of renewable energy sources, which would assume crucial importance/technical-economical-productive base and the construction of a sustainable energy matrix, against the backdrop of climate and demand by configuration/application of a Global Climate Agreement. Thus, economic policy should be to interact systematically with the energy policy and environmental policy, as well as other spheres of public policies, through the strategic management of the energy matrix and the construction of a sustainable energy matrix, in a effectively systemic perspective. The transition of energy-environmental paradigms implies a strategic posture, of a managerial-planning-organizational character by an intervention on the productive base and the construction of a sustainable energy matrix. For this, it is necessary to implement the strategic management of the energy matrix, seeking its diversification and growing significantly, the participation of renewable energy sources (the leading energetical of a new paradigm), gradually/evolutionary and meeting the needs and the reality of each context (mainly the national context).

This is taking into consideration the energy base, the universe of natural resources, the productive structure, the technology source and

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growth/development needs. On the other hand, the construction of a sustainable energy matrix has as its backdrop the climate issues (carbon emissions reduction) and, on the principle that the climate changes, in this or that magnitude, have, in fact, a significant anthropic/anthropogenic component, the deployment of a significantly cleaner energy matrix reinforces by means of the strategic management of the energy matrix and the construction of a sustainable energy matrix, the systematic interaction between the different spheres of public policies (economic, industrial, agricultural, technological, environmental, energy, etc.).

GLOBAL CLIMATE AGREEMENT

The issue of Global Climate Agreement finds innumerable difficulties to its effective realization and awakens debate/controversy contentious argument. However, despite this, some important steps have been taken in this direction and probably would be better to reflect on them, in order to analyze the degree of implementation, its scope and range, as well as their possible and/or effective implications. To Freitas (2007, s/p), for example, the Kyoto Protocol enabled the creation of more flexible mechanisms that enable the reduction of costs of implementing technologies that contribute to GHG reduction, in order to mitigate climate change. Of these mechanisms, the one involving the so-called developing countries, namely, peripheral/semipheriferal countries, is the Clean Development Mechanism (CDM), which allows a country said developed/industrialized (belonging to the organic core of central world economy) can reduce their GHG emission levels through the feasibility of sustainable development projects in countries with the lowest level of development.

In fact, the Kyoto Protocol represents the most important international decision as to consider economic growth and environment, giving an essential role to technological innovations. However, despite these positive aspects, the Kyoto Protocol, in accordance with the opinion of the IPCC, is still insufficient with regard to mitigate climate changes, which would go through profound changes of civilisation. It is at this point that attention to the fact that they are the central

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countries (rich countries), in historical terms, the biggest emitters/polluters, while peripheral /semiperipheral countries need to grow and to promote the sustainable development of their economies. This aspect is of crucial importance, not only as regards the historical-energetic liabilities, but also about the fact that the peripheral/semiperipheral countries have the right to grow, to develop and to improve their insertion in the context of the world economy. It is obvious that in many chapters developing nations, especially the emerging economies of the semiperiphery, don't have to walk the same path of energy inefficiency and neglection/harmness of the environment taken by central countries due since the Industrial Revolution, due to technical progress, less energetic technical/production processes, more advanced methods of organization/production management/management of natural and energy resources and the introduction of renewable energy sources, especially biomass.

However, there are other issues which hinder the achievement of a Global Climate Agreement, which, as alerted by Oliveira and Vecchia (2009, pp. 957-960), relate to the increasing complexity of environmental problems of the data/scientific evidence about the same and the degree of confidence with respect to appropriate information to support the decision-making process. In fact, there was a large set of uncertainties (starting with scientific uncertainty) with regard to environmental issues, and few would be the critical analysis of uncertainty and its possible impacts on the environment and society. This would open up space for the questioning of the relationship between the scientific and the policy component, since the risk analyses and cost/benefit, arising like support decision makers (politicians, managers and policy makers), are based on analyses of pseudoscientific character and whose results are incorporated as absolute truths.

In reality, what it is considered is that there is still a scientific consensus established on the controversial issue of climate changes and global warming and the political component often seems to overlap the scientific argument, also drawing on her when goeds to interests they defend. The fact is that there is an ocean of uncertainty and a huge diverse set of interests/between alarmism about global warming and the stance of refusing the «Human Action/Global

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Warming». On the other hand, the rhetoric of global warming would serve as base for carbon shaft untying «Production/Consumption», leading to a new configuration, spatial and social energy, based in small units, settlements reduced and rejection of economic growth so as to lead to an egalitarian society (the utopian-ecologist project). However, the ecologist utopia (or ecofundamentalist) does not meet minimum fundaments in reality. The pressing needs of the countries of the periphery/semiperiphery to overcome the delay, eradicate the focuses of misery and incorporate the tremendous economic and social excluded to make totally unworkable in practice and point to a systemic energetic-environmental systemic-strategical intervention as the only possible alternative.

Finally, on the principle that the anthropic/anthropogenic component has a considerable weight in terms of climate changes or if you do not know the effective degree of its responsibility regarding the global warming (uncertainties from a scientific point of view), global initiatives, of the Kyoto Protocol to difficult Global Climate Agreement, become extremely necessary. So, to address the issue of interregional, international or even global cooperation in order to promote a strong/progressive reduction of GHG emissions, in order to stabilize in the long run (in 2050), the level of concentration of these gases in the atmosphere, Viola, et al (2008, pp. 14 and 15) introduce simultaneous paths/additional feature which would lead to desired reduction/stabilization. These would be the following: accelerate growth in energy efficiency, stopping deforestation and promoting reforestation, increasing the use of land-use techniques that are virtuous in the carbon cycle, increasing the level of participation of renewable energy in the energy matrix, increase the proportion of nuclear power in the energy matrix, accelerate the development of technologies to capture/kidnapping of fossil carbon, promote the development of integrated systems of transport/energy, stimulate the development of the hydrogen cell, etc.

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SUSTAINABLE ENERGETIC MATRIX

The construction of a sustainable energy matrix has as its backdrop the climate issues (carbon emissions reduction) and the promotion of a greater degree of participation of renewable energy and/or even green. The paradigmatic transition in energy-environmental terms it would have a strategic element of reinforcement/implementation. This would set a new style/model of development. The construction of this new development model would pass, necessarily, for the strategic management of the energy matrix, by the construction of a sustainable energy matrix (renewable or green) and the dynamic interaction between the different systemic-components of Public Policy.

At the level of interaction between economy, energy and environment, it is noted that one of the pillars of this systemic-dynamic relationship is the need to promote the sustainable energy matrix, due to the strategic management of the energy matrix with environmental implications (growth of the percentage of participation of renewable energy), energy (valuation of autochthonous energy sources and reduction of dependence on external energy) and economic (reduction of exogenous energy sources with positive impacts in terms of external accounts). The sustainable energy matrix may mean, in the context of the systemic-interactuve view here contemplated, a stabilization base in search of a new model/style of development. It is at this point that the different relative positions of central and peripheral/semiperipheral countries about the history and magnitude of emissions, as well as with regard to growth and development needs. Anyway it is worthy to note that, despite the position currently occupied by China, the world's largest emitters/polluters remain the countries belonging to the «Organic Central Core» of capitalist world-system economy, holders of capital and technology, which could mean, on the one hand, an essential element in the pursuit of more equitable criteria in an attempt to resolve the energy and environmental issue. However, on the other, this aspect is a huge complicator (practically an obstacle), for example, the establishment/application of global terms/agreements at the level of CO2 emissions, environment and climate changes, which arises as a result of the inequality/heterogeneity that mark the setting for the world economy itself.

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An extremely importante aspect inn seeking a diverse/sustainable energetic matrix, a strategic instrument of a new energetic mix in the paradigmatic transition stepand which is coherent with the resources and technological-energetic-productive *savoir-faire* of the peripheral/semiperipheral countries, mainly in the case of the Humid Tropicscountries and particularly in Brazil situation, in regard to the energetic use of biomass.It should be highlighted the use of biomass in cogeneration, whichis maximized through heat and power generation. Indeed,such conditioning/constraintsend up constituting Strong points and ooportunitiesfor biomass difusionat the level of the Brazilian energetic-productive matrix(and other Humid Tropicscountries). The relationship between economy(through economical politics) and the search for a sustainable energetic matrix is the fact that a major diversification of the referred matrix , mainly by native energeticsthat use as source the biomass, will result in currency saving, job post creation, regional development,company creation and income generation. However,hat relationshiponly makes sense if exists, considered and analyzed in a systemic-integral way,, that isin the ambiance of a dynamic-interactive approach in all areas typical of public policies.

Thus, within the systemic contextin the ambiance of the *Public Policy* is that the relationship «Economy/Energetic Matrix» gains importance, since diversification/sustainability from it will not only impact on economical-financial nature as well as industrial, technological, energetic, environmental etc. This is noticeable in the case of biomass for the Humid Tropics countries, notably Brazil. The energetic use of biomass, undoubtedly,will lead to a diversification of the energetic matrix, with notorious impact onthe level of autosuficiencyof the countries which adopt such option. With that,it is reachable an energetic matrix of high level of energy sustainability (a significantly cleaner energy matrix) and extends the possibility of promoting more flexible/strategic management of it. In addition, the entrance of renewable energy (mainly biomass) will have profound implications in terms of productive structure, industrial base and technological scope. Biomass, and also other sources of renewable energy such as the use of solar and eolic energy, rises as strategic outlining elementfor the peripheral/semiperipheral countries not only start pass through more sustainable ways in terms of their energetic matrix, reinforcing their position

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concerning a configuration of a possible/desireable world/global climate agreement, as well as assigning themlower levels of energetic dependence and also enablingthe burst consecution with the peripheral/semiperipheral condition and the overcome of country/economy stage, in order to leverage a real process of development.

The use of biomass energy presents several constraints, such as the question of competition between energy and food, the impoverishment/exhaustion of the soil (in the case of cane-sugar) the strong need of intense efforts of irrigation and the high use of basic petrochemical fertilizers (also in the case of sugar cane). However, those criticisms, in most cases, are not based on practice, do start from a static-catastrophist view vis-à-vis the political and institutional environment, the strategic-planinng scope and changing technology. In fact, overcoming these limitations imply to carry out intense research and development efforts (P&D), the constant improvement in terms of process engineering and the consequent increase in the level of technological capacity, of vital strategic importance to the development of peripheral/semiperipheral Humid Tropics countries. This, ultimately, presuposes a more effective presence/action of the State-interventionist and strategic-planning components.

Despite the advances registered in the last four decades, in the Brazilian case, as alerted by Teixeira (2003, pp. 11 and 12), the use of energy sources from biomass (sustainable energy sources) occurs marginally, usually inserted into other specific production systems. In these, the basic input gives rise to various products. On these, the basic insume originates diverse products. Thus, the sugar cane supports the alcohol, sugar and electricity combination in production. In its turn,the use of biomass in industry is not linked to reasons of social and environmental, but due to show the technical-economical feasabilityat the level of specific processes.On the other hand,to Costa and Hoeschl (2006, pp. 30 - 33), the biofuels e.g., comprise one of most efficient means the energetic matrix diversification, once contribute for the reduction of GHG emission, are engine of economic development (by optimizing/decentralisation of investments) and promoter element of social development (employment/income generation in rural areas). To this end, it is

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necessary the establishment of support mechanisms for the production/marketing of biofuels, which can be achieved in a broader scope, in the field of public policy and institutional base, as well as, in more specific terms, through the integration/interaction of public bodies, private institutions and producers. In fact, biofuels, can collaborate to build a renewable energy matrix, with very positive impacts with regard to the reach of social/environmental objectives, in order to collaborate for the reduction/minimization of emission of gases that contribute, in theory, to global climate changes.

In addition, in strategic terms, the production of biofuels aims to diversify the energy matrix, in particular in the case of countries which import of mineral diesel. In fact, in a comprehensive-strategic-interactive approach, biodiesel, to act in order to promote a higher degree of diversification of the energy matrix, making it more sustainable/clean, leads to its own higher level of self-sufficiency. The relationship between economic policy and the search for a sustainable energy matrix is understood by the fact that a greater diversification of that matrix, primarily by native energy taking as a source of biomass, will result in foreign economy, job creation, regional development, business creation and income generation. However, those relationship only makes sense if exists, considered and analyzed in a systemic-integral means, i.e., in the ambiance of a dynamic-interactive approach of all areas of the public policies.

CLIMATE ISSUES, UNCERTAINTIES AND ARGUMENTS

As highlighted by Molion is (2008b, pp. 118-127), a preview of the tendency of climate is critical to the planning of human activities (agriculture crops, electric power generation and civil defense) with a tendency to vary from 10 to 20 years, using the statistical methods (to identify cycles/frequencies) and the global simulation models (MCG), based on equations of Dynamics and Thermodynamics, but with inadequate representation of physical processes and direct feedback. However, despite the limitations, the weighting of their forecasts, taking into account the areas of greatest hit, can improve climate

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prediction for a given region and lead to anticipation in terms of planning of human activities and civil defense, going on however difficulties regarding the implementation of long-term climate studies.

On the other hand, Molion signs that (2008b, pp. 118-127) that results related to the global climate situation in recent years, could, in the view of a number of climatologists, be used in the sense of having a future vision of the climate, which appears fundamental to the long-term planning of human activities. On the other hand, the existence of long time series of meteorological/hydrological variables observed do not figure in many parts of the globe. However, the results of diagnostic studies (local/regional) and global scenarios for the period 1947/1976 (a cold phase), can be used in relatively more reliable estimation of the evolution of the climate in the next two decades. This will contribute to a better planning of human activities. This, on the other hand, it is extremely necessary to the achievement of higher than today´s future rates of human/economic development.

Soon, the issue of climate changes, especially the order of reasons for its occurrence, is not a pacific point. The anthropic/anthropogenic explanation, however, has been undermined by scientists in general linked to climatological/meteorological design or geological aspect. The critics to the climate anthropogeny could be see by Molion Molion (2007, s/p.; 2008a, s/p.; 2008c, s/p.; 2008d, s/p.; 2012, s/p.), but also by other authors. So, Figueiredo (2009, s/p.) would object the toxical/pollutant character of CO2, querying that the anthropic/anthropogenic emissions of that gas had any significant effect for a probable global warming, resting the proper idea of global warming, noting the ambiguous/retractor character of the term climate changes (these had always occurred) and alerting for the great limitation of models where a great number of variables are to be considered and for their own falibility. At this point, it is stated that the computer modelling has an outdated theoretical base, once the climate models used by the IPCC would have been designed at the beginning of the 20th century, i.e. in the time prior to the existence of meteorological satellites. Figueiredo´s criticisms (2009, s/p) are advancing in the direction of denying that there is scientific consensus about the scientific consensus

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concerned to the so-called aquecimentista dogma, whereas if there was an existing global warming, this would not be necessarily negative for the planet and humanity, due to the likely appearance of new agricultural areas, beyond reproving many of the energetic options taken from the certainty of the high weight of the anthropic/anthropogenic component in regard with the global warming.

In the list of the authors who query the anthroponic/anthropogenic component of the global warming and this itself, include Leroux (2006, s/p), which records that global warming would be a chance provided by theoretical models based on simplistic assumptions that point to an increase in the temperature, which is proclaimed but not demonstrated. The argument against the idea of the existence of an effective global warming would be scanning a climate deviation (not predicted by models) in the seventies. In fact, there would have been a gradual increase of violence/irregularity of the time and that would have been caused by the modification of the general circulation of the atmosphere. Therefore, the key issue would not be the forecast of the climate in 2100, but before the determination of the causes of the climate deviation, which would provide preview of evolution of the time in the near future. On the other hand, the global warming theme (at first related to climatology) would have lost their scientific content being treated with irrationality/scaremongering. Otherwise, the knowledge of climatology would be generally limited, which would be reflected in the high degree of inaccuracy of the models.

In fact, as noted by Leroux (2006, s/p), which would prevail in the debate (distorting) is the idea that climate changes is a subject of weather treated as if it were an idea related to environment. The translation of the environment would come attached to the topic of pollution, which in turn would be moral alibi, for the most part relied on by non-climatologists. In fact, the link «climate/pollution ' woud not be proven, except to scale of cities. In addition, without denying the existence of the greenhouse effect (the criticism goes to the effect of anthropic/planetary-scale anthropogenic origin), observe that the relationship between CO2 and temperature wouldn't explain the thermal evolution. This would have other factors involved to consider, but these would not be

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considered by the models. However, paleoclimate studies (indications of past climates), that would intend to support future climate changes , via the relationship «GHG/temperature», could not lead to the fact of having an idea of future amendments, since the past and the future are not directly comparable. There would also be to clear if there would be an overall development of temperature or if the same developments would be just regional dimension. In other words, would it be possible to have a sharp change in temperature and climate on a global scale? The answer could be given from major changes in terms of climatology/meteorology.

THE NATURE OF GLOBAL WARMING AND THE RELEVANCE OF WATER VAPOR

The relationship «Water/Environment» manifests itself in various ways, generally identified as consequences of man's action (on streams, rivers, ponds, lakes, ocean-coastal areas and oceans) and the impacts of industrial, energetic, energy waster and consumist society. In fact, these impacts are real and must be mitigated/reducted and even minimized as far through a correct strategy at the level of the definition/implementation of public policies and initiatives of institutional cutting assigned to environmental area and the other threads related to it (energetic, productive, industrial, etc.). However, a more thorough approach about the causes of global warming and climate change, the relevance of water (or better, of the water vapor) in the context of climatic-environmental issue, evolves from a position that could be called "passive" (impacts of man's action on the aquifer springs and seas) for another which would be called "active" (impact of water vapor on the climate change and global warming).

In examining the question of the role of nature in the global warming, Conti (2005, p. 73) notes that climate change could be caused by significant influence of processes derived from nature, which would not be properly evaluated yet. In this sense, the anthropic/anthropogenic action would be only an aggravating factor. With respect to the greenhouse effect, it is observed that this should be in just 40% of the gases from human activity – CO2 (25%) and other gases (15%), with the water vapor to assume the other 60%. So, the most active agent

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of the greenhouse effect would be the water vapor, which would collaborate in an intense/dominant way, in the process of global warming, regardless its volume in the atmosphere of the action of man. In fact, the solar radiation focuses on liquid surfaces and transform the water from liquid to gas. In fact, what happens is that solar energy is much more intense in areas of low latitudes than at higher latitudes, concentrating the heat in the oceans, once less than .25 of submerged lands are situated in the intertropical zone, which significantly enhaces the process of evaporation. This steam is distributed all over the world due to the general dynamic of atmosphere itself, and eventually strengthen/enhance the global greenhouse effect. However, most studies/texts properly evaluate the role of water vapor in the process of planetary warming, since overstimate the anthropic/anthropogenic origin.

However, the worsening of the greenhouse effect could also, according to Moliom (without/date, pp. -10; 2 2007, pp. 4-7), be due to cyclical variations of planetary albedo, i.e. the largest entry of short-wave radiation. The reduction of reflectance (or albedo) would produce greater input of shortwave radiation, which would lead to the elevation of the amount of energy available in the Earth's atmosphere. During the phase of low planetary albedo, oceans would heat and part of the CO2 released would not be absorbed by the ocean environment during the carbon recycling process. Such would occur due to the fact that the conversion of CO2 into liquid is inversely proportional to its temperature, that is, the higher the temperature of the oceans (and CO2), reduced is the ability of this gas liquefaction, with the surplus to be stored in the atmosphere. On the other hand, it is possible that the accent of the greenhouse effect can still be related to low volcanic activity recorded for nearly two decades, which would tend to raise the temperature of the planet. In fact, after a large volcanic eruption there is the effect of low temperatures. Finally, it is recalled that the greenhouse effect would be a natural phenomenon, and without it the average temperature of the planet would spend something around 15 C to -18° C, which would make impossible the per manence of the biosphere as is known currently.

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FINAL CONSIDERATIONS

It is necessary to overcome the uncertainties about climate change, in particular with regard to the real dimension of anthropic/anthropogenic component. It is also needed to examine, dispassionately, agro-energy data and its real implications. It ss still crucial considering the technological dynamism as major factor for the viability of alternatives and overcoming restrictions and constraints. On the other hand, the level of peripheral/semiperipheral countries, only a strategic-systemic view of the productive system can set a new energy model of sustainable base, without direct to the fundamentalist environmentalism or undergo a design based on ecological catastrophism and environmental determinism..

The fact is that the issue is extremely complex, so as to require the development of studies and researches related to identify the actual weight of the anthropic/anthropogenic component, as well as the processes derived from nature.

A sensible position is presented by Eerola (2003, p. 1), who advocates taking attitudes that may reduce the possibility of anthropic/anthropogenic efects on climate to reduce GHG emissions, instead of restricting them and wait for what might occur. But Molions proposal (´without/date, p. 12) follows in the sense that major initiatives are taken, having as theme the recital of that population increase is inevitable in the near future. Thus, common sense suggests the adoption of environmental conservation policies well prepared, without dogmatism, as well as changes in consumption habits so that humanity can survive, that is, so that future generations can dispose of the natural currently resources.

Therefore, environmental conservation is needed and regardless of climate change, namely, global warming or cooling. In addition, Eerola (2003, p. 8) notes that in the absence of sufficient evidence is of enormous difficulty to see if there will be a global warming caused by man. Therefore, when in doubt, becomes quite risky to continue with the same oversight at the level of GHG emissions. Such would be a huge risk and the assumption of that risk would

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have damaging consequences, involving costs very much higher than those to be incurred on prevention. So, when in doubt with respect to the effective weight of human action (or likely human action) on climate change, we might as well pursue a separate path in terms of development standards/styles, which will involve new consumption habits, new and more efficient ways of using energy, in reducing the level of waste, the adoption of a vision quite frankly conservationist with regard to natural resources/energy exploitation/use, in defining/implementating low profile patterns regarding energy consumption and the pace of extraction/use of resources from nature, in the substitution of fossil fuels by renewable energy sources, etc.

On the other hand, it should be taken into account, as done by Eerola (2003, p. 3), that the skepticism shown by many geologists with regard to climate change caused by human action, could be related to these professionals who maintain ties with the production of fossil fuels and other non-renewable natural resources of geological origin, beyond their knowledge of climate changes of the past. However, the drum of the uncertainties and heated debates between skeptics and supporters of anthropic/anthropogenic component of climate changes and their respective critics, it is necessary to have common sense, discernment and strategy/planning capacity, so as to reduce or at least attenuate/mitigate the possibility of occurrence of the same, from the reduction in the consumption of fossil fuels; the promotion/encouragement to R&D at the level of renewable and non-conventional energy sources of energy; encouraging the energy conservation/rationalization; promoting targeted efforts to research, development and innovation (RD&I) at the level of technologies, processes and equipment of energy production/final use; encouraging interdisciplinary research on climate changes; the deepening of the efforts related to recycling as a strategy of conservation of the natural resource base and diversification of own energy base; and the accent of initiatives directed to the creation of a culture of greater respect for the environment.

The fact is that the strategic-pragmatic treatment of climate modificatons/changes issue should overcome the limitations of ecofundamentalist character and also the critical-skeptical assumptions related

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to human causes (GHG emissions), based on the uncertainty of the levels and dimensions of the same impacts and focusing on configuration/implementation of a development design/style based on energy-environmental paradigm of the future already being developed in current paradigmatic transition. Therefore, it would behoove pass over antagonism/about the real causes of the climate modifications/changes and effective role assumed by global warming. To this end, it would be necessary to deepen the knowledge on climate evolution and planetary geological history by implementing efforts on research/investigation on climate and its changes/modifications, so as to set domain of scientific knowledge on environmental irresponsibility and the ecofundamentalism/eco-alarmism. With this, a new precept, in terms of development, which has as leitmotiv the reduction of GHG emissions, the search or sustainablity and respect to environment, would be defined.

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