Conceptual paper

Climate change, ethics and sustainability: An innovative approach

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\textbf{A B S T R A C T}

Our goal in this article is the analysis of the state of affairs, regarding the phenomenon of climate change and its impact in different areas. We synthesize the various approaches available in the scientific debate on this subject, mainly the one that affirms the existence of global warming and the current approach, which denies it. Beyond the controversy, what seems to be evident is that there is a multifactorial causality in a phenomenon that affects anthropogenic factors a well. Since some environmentalisms exclude the human being in their consideration of the ecosystem, and if they do, they accommodate man in their approaches always as a variable that distorts and deteriorates the environment, we believe that a fundamental rethinking of the issue is needed, from the perspective of an integral environmentalism. The environmentalism we propose not only does not exclude the human being from this multifactorial equation, but also considers man as the fundamental, modifiable variable in that process. We thus consider the environmental problem in the broader framework of an integral ecology, where the human being takes a central place, understood as a free person and a moral subject, responsible for his actions and a key element in any consideration and review of the process. In this context, the concept of sustainability emerges as a key concept that must guide human action in all areas, a concept from which it is possible to appeal to the responsibility of man within the framework of an ethics of sustainability. Man is called to do right in all orders. When he does not respect this ethical orientation, so implicitly included in his own conscience, he becomes denatured and suffers the consequences in himself and in the environment in which he lives. We believe that it is a priority to seek the foundations of the existence of God, analyzing the theistic view, the foundations of sustainability for the good of man himself and the planet.

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\textbf{Introduction to climate change}

Climate change is nowadays an unquestionable phenomenon that is well studied and referenced in the main scientific journals, especially in the field of natural sciences. Although we are not going to propose here a specific vision of this phenomenon from the scientific-natural environment that dominates the perspective of scientific consideration; our contribution is rather, sensu stricto, in the field of anthropology, which is our specialty. In fact, in the study of this phenomenon, we would like to raise and broaden awareness on the relevance of a conception of sustainability from the viewpoint of ethics; in other words, we aim to present an innovative approach of an ethics of sustainability that we consider necessary in order to address possible solutions that have an impact on the bottom line of this issue.

On the one hand, methodologically speaking, we consider that if we do not reflect in depth, interdisciplinarily, on climate change and on all its dimensions, we will narrow our vision of this phenomenon and thus become impaired, because science does not occur in a sealed compartment, but in the interaction of disciplines and perspectives, in that broad dialog of the sciences of which Benedict XVI\textsuperscript{1} speaks. On the other hand, we should also not fail to mention in this article a perspective of relevant reflection that can shed some light for a broader consideration of the phenomenon of climate change from a historical perspective.

\textbf{Global warming}

In the face of evidence of the increase in Earth’s average temperatures that science confirms is taking place in different points

\textsuperscript{1} As the Holy Father Benedict XVI emphasized in his speech to the University of Regensburg on September 12, 2006. Available at: https://w2.vatican.va/content/benedict-xvi/es/speeches/2006/september/documents/hf_ben-xvi_spe_20060912_university-regensburg.html.
and latitudes of our planet, and the clear influence of human action in this process, which has been termed the *anthropogenic factor*, we want to stress from the beginning that we must do everything in our power to improve climate and environmental conditions. It is a serious responsibility that we, as administrators of the planet’s resources, have; we must pay attention to the consequences of our action on the conditions in which life develops. We are committed to the preservation of life and the natural heritage we have received and for which we feel responsible.

In this sense, we favor the initiatives aimed at the reduction, in as much as possible, or the total elimination of greenhouse gas emissions (GHGs), particularly of CO₂, which are known to raise the average temperature of the Earth, as well as the complete eradication of emissions of other gases such as CFCs, which damage the ozone layer and are also fully replaceable by other non-harmful components. We also want to call for the preservation of fauna and flora species, as well as all the biodiversity of our planet, particularly the care for the oceans and the seas, which also suffer the consequences of global warming with high increases in temperatures, and also with elevation of the sea level, acidification of the environment, and deterioration of ecosystems, amongst other alterations.

We also want to draw the necessary attention to the consideration of human living conditions. Because we cannot lose sight of the fact that man is the main actor that is also part of that ecological environment that we want to preserve. We must keep the human being in mind, and his need for development in any realistic consideration of the environmental problem.

It would be a fallacy for us to think about protecting our environment without allowing the necessary development of the human being at the same time. In fact, we firmly believe that if the preservation of the environment comes into collision with human development, the chain will break at its weakest link, and this is the preservation of the environment. We cannot be naive in this regard, there are many illustrative cases. Another question is what kind of human development should we look for and foster so that man is viable and sustainable in the long term on the planet. This is the question we want to reflect on in this paper.

Climate change: a broader vision

Although it is scientific evidence, particularly meteorological evidence, that we are facing a global warming in the planet that requires decisive action on the part of human beings, we believe that we should exercise the utmost caution when investigating the reasons behind a global climate change we may be witnessing that some qualify as unique and irreversible in the history of our planet. There is some research in other areas of science that we should not disregard as it could shed some light in our consideration of the phenomenon.

Stratigraphy is a branch of geology concerned with the study and interpretation of stratified sedimentary, metamorphic and volcanic rocks found in soils.

Archeological stratigraphy deals with the study of the various layers (strata) of earth that have been deposited in soils and are of archeological interest. Through this science, we learn that the different layers of materials found on the ground are ordered and reveal valuable information. The strata are arranged vertically according to their age, the oldest ones are located deep down while the younger strata are located above. This geological circumstance, this surprising ordering of the strata, allows for stratigraphy to date the time of sedimentation of these materials. Each layer has a different age which can be inferred from the place where it is located. This even allows for archeological stratigraphy to specify the time an archeological artifact belongs to according to the stratum and the depth where it was located. Stratigraphy therefore allows for a *chronological dating* of the soil layers and the objects that are found within them; but not only that.

It is estimated that our planet is about 4600 million years old. In all this time various sediments have been deposited in the soil forming layers or strata, not only on the mainland, but also on oceanic soils. From the study of the terrain and the type of sediment that we find in terrains, we can not only date them, but also establish the climatic conditions in which they originated. That is, sediments are indicators of diverse environmental conditions that have occurred throughout the history of our planet. They are fossil brands that tell us about climate changes that happened in the past. Therefore, the stratigraphic record shows that the phenomenon of climate change has occurred on several occasions throughout the history of our planet.

Fossils are the remains of living beings and their activity, which have been recorded in rocks by a physical–chemical process called fossilization. From a fossil we can also derive a lot of information, specifically paleogeographic, paleoecological and paleoclimatic information.

The fossil record represents an immense archive that spans from about 3500 million years ago to the present. Fossils offer relevant information about the climate variations that occurred on Earth. Fossils allow us to obtain paleoclimatic information, information about the climatic changes that occurred in our planet in the past. Among other things, the disappearance of many species adapted to mild temperatures indicates a sudden change in the temperature of the Earth, due to an ice age. There are experts who, based on these records, establish the possibility of “elaborating a geological time scale with paleontological data, a biochronostratic scale”.2

The fossil record also informs us about variations that have occurred in terms of sea level. Thanks to fossils we know that there have been important variations in sea level and tides in the past and that they have been very relevant. In fact, we can find marine fossils inside a continental area, sometimes even at the top of great mountain ranges. Today we know that throughout the history of the Earth, periods of marine *transgression* have occurred, where the sea has invaded large continental areas. On other occasions, marine regressions have occurred, times in which the sea has retreated. All those changes can be seen in the fossil record.

Therefore, the fossil record and the stratigraphic record are two sources of relevant information on climate: The fossil record and the stratigraphic record should be considered as two dissociable components of the *geological record*.3

Although both records are integrated to form the geological record, they are actually two dissociable sources of knowledge, that is, two different and separate references; and through both we know that the climatic conditions have not always been stable in our planet, but rather the opposite, i.e., there is scientific evidence that there have been very important climate changes in the history of our planet.

We believe that this research should not be disregarded in the study of climate change in case it could provide some novel perspective in the consideration of the issue especially in the medium and long term. However this should not represent an obstacle to denouncing the current situation and finding solutions at this time.

The concepts of sustainability and sustainable development

The concept of sustainability

Sustainability is ‘the ability to sustain’, to stay, to endure. It is the quality by which an element, system or process, remains active

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3 Holy Father Francis (2015).
over time. In economy this quality would be given by profitability, by the capacity to obtain benefits, although this is a very limited or restricted conception. Sustainability, in a broader context, refers to the satisfaction of our current needs without compromising the possibility of future generations to satisfy their needs, that is, making responsible use of resources to ensure a not always easy balance between economic growth, environmental care, and social welfare.

**Sustainable development: the example of the forest**

The concept of sustainability is closely linked to the concept of sustainable development, being the former understood as a way of progress that maintains a balance between meeting the needs of today, without putting tomorrow’s resources at risk.

“Sustainable development” is a term coined in 1973 by Hanns Carl von Carlowitz, Head of the forestry service of the Saxon elector, in Germany. This forest guard illustrated the concept of sustainability through an example that was close and well known to him: the example of using a forest as a source of natural resources.

If we cut down a bit of wood from a forest, it alone regenerates and continues to produce more wood every year, but if we cut all the trees in the forest it disappears and it will never produce wood again.  

This definition was later rediscovered, in 1987, by Dr. Gro Harlem Brundtland, Prime Minister of Norway, on the subject of a socio-economic report by the UN: “Our Common Future,” in what today is known as the *Brundtland Commission*, which tried to find alternative solutions after the oil energy crises of the 1970s.

The highest authorities of oil-producing countries are well aware of the implications of implementing policies based on sustainable development and the profound transformations that can result from this, because, as stated by Sheikh Ahmed Zaki Yamani of Saudi Arabia, responsible for the oil policies of his country for over 20 years: “Just as the Stone Age did not end because of the scarcity of stones, the Oil Age will not end because of the scarcity of oil in the world.”  

It is not the scarcity of a resource that determined its decline, but typically other factors, whether economic, technical or environmental.

Pope Francis urged us to search for solutions in this area of sustainable and integral development in his encyclical letter *Laudato Si*:

“The urgent challenge to protect our common home includes a concern to bring the whole human family together to seek a sustainable and integral development, for we know that things can change. The Creator does not abandon us; he never forsakes his loving plan or repents of having created us. Humanity still has the ability to work together in building our common home. Here I want to recognize, encourage and thank all those striving in countless ways to guarantee the protection of the home which we share. Particular appreciation is owed to those who tirelessly seek to resolve the tragic effects of environmental degradation on the lives of the world’s poorest. Young people demand change. They wonder how anyone can claim to be building a better future without thinking of the environmental crisis and the sufferings of the excluded.”

Man cannot accept a state of affairs or a process as an inevitable destiny. Nor can we consider only our personal circumstances or our own vital expectations, but we must consider those of the ones who suffer most, such as the poor, the helpless, the underprivileged of our time, and those of the ones who will come, the future generations, who are not guilty and have the right to inherit the natural heritage in the best possible condition. We have a responsibility toward them, toward the poor and marginalized those who suffer most from the consequences of environmental deterioration, and we must look toward the new generations.

The right of the poor to be assisted and the right of future generations to find a beautiful and healthy environment constitute moral obligations for us. We cannot ignore them. We cannot shirk this serious responsibility we have. Surely those who have children understand perfectly, because parents always want to leave their children in the best possible conditions when they are absent, even when they can no longer see them. Love for a child motivates their concern and anticipation. This also has to do with the concept of sustainability; let’s go a bit deeper into this notion.

**Triple dimension of sustainability**

We have to analyze how this conception of sustainability that we advocate is expressed and made concrete; what are the underlying concepts and principles that govern it, so that it is not merely a nice concept, empty of content, but an absolute necessity. We propose a triple dimension here in the consideration of sustainability from which we can provide the concept with more solid content and specificity.

**Human development**

We advocate a criterion of human development, understood as the development of human capabilities, as opposed to the traditional and prevailing concept of development merely referred to the economic sphere and measured by GDP. The economic aspect is only one aspect, although necessary and relevant, within a broader spectrum of the full development of the human being, which includes other dimensions and capacities that cannot be excluded.

Pope Francis expressly recognized the importance of technology and its contribution to sustainable development in his encyclical letter *Laudato Si*:

Technology has remedied countless evils which used to harm and limit human beings. How can we not feel gratitude and appreciation for this progress, especially in the fields of medicine, engineering and communications? How could we not acknowledge the work of many scientists and engineers who have provided alternatives to make development sustainable?

But Pope Francis also underlined, in relation to the technocratic paradigm that seems to prevail across the whole world, that:

*The basic problem goes even deeper: it is the way that humanity has taken up technology and its development according to an undifferentiated and one-dimensional paradigm (. . .) Now, by contrast, we are the ones to lay our hands on things, attempting to extract everything possible from them while frequently ignoring or forgetting the reality in front of us. Human beings and material objects no longer extend a friendly hand to one another; the relationship has become confrontational.*

We have a way of relating to nature that is not harmonious, balanced, responsible, but one that dissociates us and confronts us with nature.

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5 UN (n.d.).
6 Holy Father Francis (2015).
7 Holy Father Francis (2015).
8 Holy Father Francis (2015, n. 102).
9 Holy Father Francis (2015, n. 106).
“This has made it easy to accept the idea of infinite or unlimited growth, which proves so attractive to economists, financiers and experts in technology. It is based on the lie that there is an infinite supply of the earth’s goods, and this leads to the planet being squeezed dry beyond every limit. It is the false notion that “an infinite quantity of energy and resources are available, that it is possible to renew them quickly, and that the negative effects of the exploitation of the natural order can be easily absorbed”. 10

Resources are not infinite and nature does not have an unlimited capacity for regeneration. We are deluding ourselves if we believe that there are no limits in nature, and that we do not pay a high price for over-exploitation of the natural resources.

Social development

There is also a need to establish a criterion by which the social dimension, which contains all human rights – i.e. civil, political and social – is included, and in which both the legal and express regulatory recognition and the status of effective compliance are contemplated and duly reflected, for example by specifying the various rights, such as, among others, the social rights of citizens against poverty.

Pope Francis has paid much attention to “the intimate relationship between the poor and the fragility of the planet”11 in his Encyclical letter Laudato Sì, the core document that guides all the fundamental orientations of the Catholic Church in this area.

We cannot forget that it is the most disadvantaged and the poor of the planet who suffer the most serious consequences of many of the environmental disorders. Pope Francis insists recurrently on the particular effects on developing countries:

Climate change is a global problem with grave implications: environmental, social, economic, and political as well as for the distribution of goods. It represents one of the principal challenges facing humanity in our day. Its worst impact will probably be felt by developing countries in coming decades. Many of the poor live in areas particularly affected by phenomena related to warming, and their means of subsistence are largely dependent on natural reserves and ecosystemic services such as agriculture, fishing and forestry. 12

We believe that this consideration of Pope Francis with the most vulnerable countries and areas of the planet, and this sensitivity to the most disadvantaged must be the subject of particular attention in our consideration and application of sustainability.

Integral development

The environmental field is the most well-known aspect, because ecology and the concept of sustainable development are widespread.

Following Pope Francis in his encyclical letter Laudato Sì our line of research should address an “integral ecology, one that clearly incorporates all the human and social dimensions”. The Pope invites us to review the basic concepts and their relationships in order to think about the changes and challenges we face. Thus, in his encyclical Laudato Si’ he explains:

When we speak of the “environment”, what we really mean is a relationship existing between nature and the society which lives in it. Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live. We are part of nature, included in it and thus in constant interaction with it. (…) Given the scale of change, it is no longer possible to find a specific, discrete answer for each part of the problem. It is essential to seek comprehensive solutions which consider the interactions within natural systems themselves and with social systems. We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental. Strategies for a solution demand an integrated approach to combating poverty, restoring dignity to the excluded, and at the same time protecting nature. 13

We cannot separate the environmental crisis from the social crisis because both are interrelated. Therefore, we face more complex phenomena, for which the easy and simplistic recipes of the past do not work, but a broader consideration of the intricate connections that originate the problems is required, that is, we must address them from a new integral approach that considers all the dimensions of the problem.

Theistic foundation for a new ethics

Man is called to do good in all orders. We must modify our attitudes and guide ourselves toward good. Good is not a mere option for man, a mere possibility, since when he does not address this ethical orientation, implicit in his own conscience, he suffers the consequences in himself and in the environment where he lives. We believe that it is a priority to seek the foundation of the existence of God, by analyzing the theistic current, – the foundation of sustainability – for the good of man himself and the planet: if we saw the possibility of finding clean energies, gold, diamonds, water, we would all go after them. If there is the intellectual possibility of encountering God, we have to go after Him in the same way. It is not about being a believer or not being a believer, but about admitting theism, whether or not a believer.

Theism is the doctrine that asserts the existence of a God creator of the universe that mediates in its evolution independently of any religion or religious belief in it. Many great scientists and thinkers of all times have been theists, regardless of whether they had faith or not, in the sense of an experience or a personal relationship with God. We need to ask ourselves if God exists whether or not we have faith in Him, because the question is not meaningless from a rational point of view. Either that or we renounce to state the sense of meaning, although this attitude is manifestly irrational.

There is much environmentalism now that promotes environmental responsibility and increases awareness of environmental protection, but often omits man in its consideration of the ecosystem. And if man is accommodated in this approach it is almost always as a variable that distorts and deteriorates the environment. Therefore, we believe that a fundamental rethinking of these issues is necessary from the perspective of an integral environmentalism. In this regard, the encyclical letter Laudato Sì has developed a new framework to help resolve the current problems that arise in the context of this ecology that includes man. It is a very innovative document because it assumes scientific data. Data and concepts, as it was emphasized by the Chancellor of the Academy of the Pontifical Academy of Sciences, Msgr. Marcelo Sánchez Sorondo, in the 1 International Congress on Poverty, Hunger and Emerging Foods held at the Catholic University of Valencia in October last year. This novelty of this approach is already confirmed in the same terminology used by the encyclical Laudato Sì. This incorporates many terms that are novel and even striking in a document of this type, such as: global warming, concentration of greenhouse gases, natural

11 Holy Father Francis (2015, no. 16).
12 Holy Father Francis (2015, n. 25).
13 Holy Father Francis (2015, n. 139).
resources, ecosystem services, biodiversity, etc., since they go far beyond the scope of a mere religious or pastoral consideration.

In addition, Pope Francis in this encyclical expresses the urgency to develop a rigorous and profound reflection on the care for the environment, but also the need to develop new attitudes and lifestyles of human beings, from the perspective of an environmentalism that does not exclude the human being from this multifactorial equation that may be deteriorating climate, but that considers man as the key variable, however modifiable, of that process.

The Pontifical Academy of Sciences of the Vatican issued a series of documents in this field, the main one is Sustainable Humanity, Sustainable Nature: Our Responsibility, and other subsequent ones that have been substantiated in various declarations, such as the one in Human Right to Water this year, 2017, where they have been developing and defining this general framework and raising the urgency to take into consideration sustainable development as a new key to solving the problems that afflict man and the planet in our time.

**The ethics of sustainability**

The ethical dimension is crucial in this new approach to sustainability, from which we address problems. From this approach, a very clear criterion can be established in order to know when an activity is respectful of the dignity of the human being and his solidarity, whether it humanizes or dehumanizes, as Rodriguez Madariaga pointed out in the aforementioned document of the Pontifical Academy of Sciences of the Vatican on sustainability: Ethics is about wondering about the human meaningfulness of every activity, and it has an influence on both individuals and society at large. Humanization and “dehumanization” are the two ethical criteria on which lies any action that makes human dignity and solidarity into something real. As well, both criteria serve to denounce any action that goes against such dignity and solidarity.

The environmentalism put forward by Christian humanism is an integral environmentalism since it gives special consideration to the human being in all his responsible freedom and his capacity for action.

Man is never doomed to a fatal fate, however complex the situations he faces and limited means available. Man can always anticipate the consequences of his actions and modify the conditions of his existence and of the environment where he lives because he has a creative intelligence. This is a distinctive, specifically human feature. It is not only an anthropological characteristic of ontological type, prebuilt in his being, or of ethical type, given in its conscience, but an effective characteristic verifiable in his action and of which man has provided ample evidence throughout history. Although, as the Holy Father himself explains in the encyclical that establishes the framework and the new sensitivity of the integral humanism that illuminates all these documents:

“Change is impossible without motivation and a process of education.”

Man needs to be fully aware of a problem in order to try to solve it, and he needs to be educated to try to provide the means to avoid or mitigate it. Without awareness and without education no responsible action will be triggered in the human being.

The action is determinant of what we are and is not necessarily an unconscious process. Many philosophers, economists, sociologists and ethical thinkers throughout history have expressed and endorsed this relevance of ethical praxis in the determination of man’s being. We know that a repeated good habit creates a virtue, as a sustained bad habit creates a vice. In this sense, our actions lead us to what we are; and we are responsible for this.

We have to opt for good because otherwise we denature ourselves; we destroy our environment and destroy ourselves. The greatest good of man is discovering the foundation of the existence of God, because it is a strong reason to open up to hope, solidarity and the good that means a responsible sense of life, regardless of whether we have faith or not.

The ethics of sustainability must be incorporated into our daily life habits. We must assume more austere, more conscious, more responsible lifestyles with environmental problems and also with the most disadvantaged of the planet and, therefore, we must become more solidary, because we are all vulnerable, and some human beings are already in a limit situation.

We believe that for the search and maintenance of these more supportive and sustainable new lifestyles, a foundation of the existence of God is needed, from these theist postulates, and beyond our personal beliefs, as an ethical foundation of sustainability for the good of one’s own man and the planet.

From the act of opening to the Creator the Creation is contemplated under a new ethical perspective, if we renounce it we suffer the consequences of the unsustainability of our existence, the inconsistency of our actions and the deterioration of our lives and our environment. Without God, we are not sustainable.

The arrival and message of Pope Francis is providential in this regard: men, in general, and the poor, in particular, are a visible sign of the expression “new humanity”. Climate change, and in particular men who live in hunger, poverty, exclusion, children mistreated and forced to work, women forced to prostitution, the trade of human organs, and many other unjust realities of our time have in Pope Francis a defender of their lives. It is worth giving our life for men, for our neighbors, as Jesus says: “that they may have life and have it abundantly”, so that they may have eternal life. Thank you, Pope Francis, for being a sign among the poor and excluded of this world.

The election of Pope Francis is a clear providence of God for this time, especially because he constantly remembers man and the poor in particular; he is a constant sign of the expression “new humanity”. He always stresses the problem of climate change and of man, who suffers its consequences. We believe that the proposal of ethic of sustainability is necessary in order to motivate and to promote this new humanity and new civilization, so as to as Paul VI says --, “transform it from within, and renew humanity itself”.

Therefore, the approach to the climate problem and its consideration from the ethical–anthropological perspective, along with the innovative proposal of intellectually substantiating the existence of God, far beyond belief or nonbelief in a personal sense, is seen by us as key to promoting an ethics of sustainability that cannot start from other premises, but from the renewal of the human being who has the option to consider not the end of the path, but as the philosopher put it, the option of an everlasting life.

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16 Dasgupta et al. (2014, p. 22).
17 Holy Father Francis, Op. Cit., no. 15.
18 Jn 10:10.
19 Holy Father Paul VI (n.d.).
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