ppi 201502ZU4645
Esta publicación científica en formato digital es continuidad de la revista impresa
ISSN-Versión Impresa 0798-1406 / ISSN-Versión on line 2542-3185Depósito legal pp
197402ZU34

CUESTIONES POLÍTICAS

Instituto de Estudios Políticos y Derecho Público "Dr. Humberto J. La Roche"
de la Facultad de Ciencias Jurídicas y Políticas de la Universidad del Zulia
Maracaibo, Venezuela

Vol.41 *Nº 77*
Abril
Junio
2023

Cuestiones Políticas Vol. 41, Nº 77 (2023), 612-629
IEPDP-Facultad de Ciencias Jurídicas y Políticas - LUZ

Environmental crisis overcoming as a factor for achieving economic sustainability in the context of the European green course

DOI: https://doi.org/10.46398/cuestpol.4177.41

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Abstract

By means of the modeling methodology, the object of the study was the theoretical and practical aspects of overcoming environmental crises as a factor to achieve sustainability. In today's world, several crises are combined: social, political, cultural and moral, the crisis of democracy, ideology and the general crisis of the capitalist system. More specifically, the economic and environmental crises are linked to the financial crises and the existing disorientation is due, to a large extent, to the financial risks that have affected the ecological footprint of civilization. As a result of the tasks set, the concept of planetary boundaries has emerged as an effective means of measuring the state of the planet and its threats. In this sense, the concept of an economy in need of transformation has been formed, as environmental growth and technological progress are accompanied and even accelerated by economy and resource efficiency. It is concluded that, current trends on Earth are not sustainable, and traditional responses to these problems often depend on the type of economic growth that is strongly associated, simultaneously, with additional resource consumption and the policies that make it possible.

Keywords: environmental crises; economic sustainability; climate change; carbon dioxide emissions; European green course.

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Recibido el 14/11/22 Aceptado el 08/01/23

La superación de la crisis medioambiental como factor para lograr la sostenibilidad económica en el contexto del curso verde europeo

Resumen

Mediante la metodología de modelización el objeto del estudio fueron los aspectos teóricos y prácticos de la superación de las crisis ambientales como factor para lograr la sostenibilidad. En el mundo actual, se conjugan varias crisis de tipo: social, política, cultural y moral, la crisis de la democracia, la ideología y la crisis general del sistema capitalista. Mas específicamente, las crisis económicas y ambientales están vinculadas a las financieras y la desorientación existente se debe, en gran medida, a los riesgos financieros que han afectado la huella ecológica de la civilización. Como resultado de las tareas planteadas, el concepto de límites planetarios se reveló como un medio efectivo para medir el estado del planeta y sus amenazas. Es este sentido, se ha formado el concepto de una economía en necesidad de transformación, ya que el crecimiento ambiental y el progreso tecnológico están acompañados e incluso acelerados por la economía y la eficiencia de los recursos. Se concluye que, las tendencias actuales en la Tierra no son sostenibles, y las respuestas tradicionales a estos problemas suelen depender del tipo de crecimiento económico que está fuertemente asociado, simultáneamente, al consumo adicional de recursos y a las políticas que lo hacen posible.

Palabras clave: crisis ambientales; sostenibilidad económica; cambio climático; emisiones de dióxido de carbono; curso verde europeo.

Introduction

The modern world is in a crisis that is not only cyclical, but also is growing and not limited to the nature around us. In today's society, there are such crises - social, political, cultural and moral, crisis of democracy, ideologies and general crisis of the capitalist system. The economic crisis is compounded by the environmental crisis (Gulac *et al*., 2022). The global population has grown from 1 billion in the eighteenth century to almost 7.6 billion today. At the same time, per capita consumption of energy, water, space and minerals has increased. This dual development has rapidly led us into a "full world" that has begun to demand a new Enlightenment suitable for a "full world".

Civilization has faced a storm of problems caused by overpopulation, excessive consumption by the rich, the use of technologies that are harmful

to the environment, unprecedented inequality. It has been proven by science that nearly half of the topsoil on the earth has been depleted in the last 150 years, with almost 90% of the fishery resources being recovered almost completely. Climate stability is in danger; the earth is now, for the sixth time in its history, experiencing a period of mass extinction.

In addition, the scale of refugees is increasing: in 2017, there were already 60 million refugees in the world. The crisis is linked to the spread of poverty in many countries and the loss of work for a large part of the population worldwide. Billions of people are in such a psychological state that they no longer trust the governments of their countries.

The Oxford Initiative for Combating Poverty and Human Development (ORNI) has proposed the introduction of a Multidimensional Poverty Index (MPI), which focuses not only on income but also on ten other indicators related to health, education and living standards. Using this index, in 2016, the ORNI initiative numbered 1.6 billion people living in "multidimensional poverty" - almost twice as much as people living extremely poorly by income alone (Andriukaitiene *et al.*, 2019).

Boundaries have become apparent and palpable in almost all types of human activity. The model was unable to see the impressive development of pollution controls that allowed many countries to partially avoid the tragedies of air, water and land pollution. Of course, technological advances have their limits. In addition, traditional economic models, and lines or in nature, which are not able to solve the problem of nonlinearity of natural systems, such as the climate system (Eco Forum, 2021)

1. Formulation of the problem

The economic and environmental crises are linked to the financial crisis. Disorientation is largely related to financial risks. Scientists are worrying about the trends of the last 30 years that have grown when considering the explosive bank balance sheet, backed by declining equity and large-scale borrowing.

One of the consequences was a temporary boom caused by the private sector. Another consequence is the significant growth in the global financial sector (finance, insurance, real estate), called "financialization", which led to the financial crisis of 2008-2009.

2. An analysis of the latest research and publications that started this issue and that the authors rely on

The authors are based on works by such authors as: Ernst Ulrich von Weizseker, Anders Wykman "Come On! Capitalism, shortsightedness, population and the destruction of the planet. Report to the Roman Club" (Ernst Ul′rikh fon Vaytszeker and Viykman, 2019; Nikitenko, 2019a); Meadows Donella, Meadows Dennis, Rangers Jørgensen "Growth Limits. 30 years later (Donella, et al., 2018); Naomi Klein "Everything changes. Capitalism against climate" (Naomi, 2016); Maxton Graham, Randers Jorge "In Search of Welfare. Managing economic development to reduce unemployment, inequality and climate change. Report to the Roman Club" (Maxton, Randers, 2017).

An important role for us was played by Appello Jurgen's works "Management 3.0. Agile management. Leadership and Team Management" (Jürgen, 2019), James Wumek, Daniel Jones. How Toyota's production system will help prevent material loss and ensure your company's prosperity" (Woomeck and Jones, 2019: 16), Drucker Peter F. "Challenges for 21st Century Management" (Drucker, 2020), which creates the conditions for a new paradigm management as a factor of sustainable and balanced development.

Co-presidents of the Club of Rome Ernst Ulrich von Weizsäcker, Anders Wijkmann "Come On! Capitalism, short-sightedness, population and the destruction of the planet (Chkheailo *et al*., 2021). Report to the Club of Rome ", under" Come On! "Called the "new Enlightenment 2.0", which means the balance between nature and man, between long-term consequences and tactical tasks. The article was written in the context of the topic conducted by the V Specialized International Zaporizhia Ecological Forum "Eco Forum - 2021" September 14 - 16, 2021 Kozak Palace, in which the authors of the study participated with their developments (Eco Forum, 2021).

The purpose of the study is theoretical and practical aspects of overcoming environmental crises as a factor in achieving sustainability.

Objectives of the study:

- using the system dynamics and modeling method as a method of scientific research
- identifying the idea of planetary boundaries as an effective means of measuring the state of the planet and its threats;
- developing the concept of an economy in need of transformation, as environmental growth and technological progress are accompanied, and even accelerated, by the frugal and efficient use of resources;

- payment for environmental pollution as a factor in achieving social sustainability;
- the problem of global warming and joint development of climate management policy;
- identifying gaps between theory, education and social reality.
- forming the concept of the new Enlightenment 2.0 as a philosophy of balance;
- explore modern ways to reduce carbon emissions, which will serve as an indicator of success;
- to analyze The European Green Deal as a set of policy initiatives put forward by the European Commission with the general aim of making the European continent climate-neutral by 2050.

3. Research methodology

Modeling as a method of scientific research is gaining heuristic importance and spreading in connection with the development of systematic and logical and mathematical approaches in modern science. Modeling in modern scientific knowledge acts as a means of displaying complex systems, as a special form of mediation, when the researcher places between themselves and the object of research, an intermediate link - a model.

The modeling of these processes involves the creation of a mathematical apparatus, through which you can summarize the various characteristics of the global environmental process. Models created using mathematical modeling methods have the purpose to trace the conditions of overcoming crisis phenomena in the interaction between society and the environment, and also have the character of a factor of sustainable socio-economic development (Appello, 2019).

The theory of system dynamics and computer simulation is used to analyze the long-term causes and effects of population growth on the planet and the economy. The World3 computer model used in the MIT study was rather inflexible and assumed that the relationships between various parameters, such as industrial products and pollution, would remain unchanged (Cherep *et al.,* 2019).

4. Discussion of the problem

Outline of the main research material with justification of scientific results (Nikitenko, 2019b).

4.1. Identifying the idea of planetary boundaries as an effective means of measuring the state of the planet

Based on the results of scientific research, the concept of planetary boundaries as an effective means of measuring the state of the planet indicates that since the Industrial Revolution, human activity has gradually become a major driver of global environmental change. In a report to the Roman Club, scientists identify nine planetary boundaries:

1) destruction of the ozone layer in the stratosphere;
2) loss of biological diversity and extinction of species;
3) chemical contamination and release of new chemical objects (new substances of artificial origin, in particular, radioactive materials, genetically modified organisms, nanomaterials that have the potential of undesirable geophysical and / or biological effects);
4) climate change;
5) ocean acidification;
6) landscape changes;
7) fresh water consumption and global hydrological cycle;
8) nitrogen and phosphorus emissions into the biosphere and oceans;
9) concentration of aerosols in the atmosphere (Eco Forum, 2021).

4.2. An economic transformation linked to environmental growth and technological progress, which can be accompanied, and even accelerated, by the economy of resources and efficiency

Almost all trends in resource consumption, climate change, biodiversity loss and land degradation reflect the discrepancy and flaw in the vector of public policy, business strategies and social values that underlie them.

Improving resource efficiency is just a step in the right direction. Equally important is the movement towards an economy based on renewable materials, material circulation and taxes used to balance demand. If it does not work, the benefits of increased efficiency are quickly eliminated and the combination of returns and economic growth combined. Most political projects of the past did not take these ascetics into account and, as a result, failed to fully decapitate these effects, as demand for resources exceeds the pace of economic growth (Hrem and Yorhen, 2017).

4.3. Payment for environmental pollution

Climate capitalism (Ernst Ul'rikh fon Vaytszeker *et al*., 2019). In North America and Europe, the economic crisis that began in 2008 is still being used as an excuse to reduce the costs of helping other countries and curtail their environmental programs. Environmental protection projects are being canceled across Southern Europe. This is especially noticeable in Spain, where subsidies for renewable energy developers are decisively eliminated. Solar and wind power plants are moving towards default and closing. In Britain, David Cameron's filing also reduced funding for green programs (Drucker, 2020).

In order to significantly reduce greenhouse gas emissions, the only rational way is to use the principle already existing in Western legislation - the payment for environmental pollution. A carbon tax should be put in place that will reduce inequalities in society by raising the cost of greenhouse gas emissions.

Funding for environmental programs must come from environmental pollution charges. There is a need for a long-term plan of action by government officials at every level and a desire to withstand the pollutants that put us all at risk. This will not happen until the uncontrolled corporations that shaped our political culture for three and a half decades are destroyed (Kelly, 2018).

4.4. The problem of global warming and joint development of climate management policy

Global warming continues. 2016 has been a record hot year over 2015, which itself exceeded the previous 2014 record. Some 2016 studies have found new evidence for the scale of the ocean's warming. A huge surplus of energy accumulates in ocean waters, which means that much of that surplus will remain on the planet for many more centuries.

In 2017, there were massive tropical hurricanes in Asia and the Americas that caused massive destruction in Texas and Florida. Climate change is a problem to which international agreements are needed. The world is still moving in the direction of at least three degrees Celsius. All this indicates that joint development of climate management policy is needed (Klein, 2016).

4.5. Gaps between theory, education and social reality

The divide between economy and ecology, which has lasted for almost two centuries, is a striking instrument of a common problem. The fragmentation of knowledge leads to the loss of perspective and vision of the interconnections and interdependencies between the elements

and the wider whole to which they belong. This has led to a policy that tries to address highly specialized issues and does not take into account their impact on other areas. It was for this reason that until the 1970s, no one considered environmental studies important when planning new commercial or community projects.

The economic model is not generally designed to reflect the world, but is a way of exploring what theoretical assumptions and abstractions can lead to. The gap between academic study and the needs of the real world leads to even greater gaps in all areas.

The concept of the new Enlightenment 2.0 as a philosophy of balance has been formed. The philosophy of the new Enlightenment (Enlightenment 2.0) must strike a balance between:

1. between humans and nature, namely the use of residues of natural landscapes, water bodies and minerals mainly as resources for ever-increasing human development and consumption;
2. between farsightedness and myopia (in balancing these problems);
3. between speed and stability (today's dependence of civilization on the speed of development destroys the structures, habits and culture that emerged on the basis of sustainability);
4. between the private and the public (history has led to pendulum fluctuations between the dominance of the private and public sectors, but history has not struck a balance between the two spheres);
5. between equality and remuneration for achievement (without remuneration for the achievement of society to lose in competition with other societies, but a system of justice and equality must be guaranteed by the state);
6. between state and religion (one of the enormous assets of the European Enlightenment was the separation of public leadership from religious, with full respect for religious values and communities) (Klein, 2016).

The problem of preventing climate change, in particular global warming, needs to be looked at more broadly, as we are talking about radical changes in the way man lives on this planet. Climate change can lead to various social, political and economic transformations that lead to shock as society's response to cataclysms. Most assumptions about natural disasters as a result of human activity confirm the fundamental changes taking place on our planet. In other words, if the air temperature reaches a certain limit, unpredictable and potentially irreversible changes can begin, which will have a large-scale destructive effect.

After that, the process will not be stopped, even by reducing carbon emissions, the real plan of reduction of which may be based on the achievements of other disciplines - physics, chemistry, biology, engineering, political science, economics. The use of fossil fuels has changed our planet so much that it is now necessary to change the level of its use. As an example, since 2012 there has been an unprecedented melting of the Greenland Ice Sheet, which leads to disastrous consequences and poses a great danger to civilization (Ernst Ul□rikh fon Vaytszeker *et al.*, 2019).

The planet is warming and this is due to human activities, which entails serious consequences and one day they will reach catastrophic proportions, as hotter climates create problems (fires in Turkey, Greece), the temperature of our planet rises due to human impact on nature. The increase in the number of forest fires is influenced by climate change, which is the result of human activity (human factor). Excess carbon dioxide and warming affect flora and fauna, as an increase in average temperature of 2 degrees Celsius will reduce the range of vertebrates by 8%, plants - by 16%, insects - by 18% (Graham *et al.,* 2021).

Excess heat will negatively affect livestock, resulting in more expensive meat, eggs and dairy products, as animals will give them less and will die more often at a young age, and as a result of rising temperatures by 2 degrees will disappear and coral reefs that provide seafood more than a billion people.

Twice as many people will not have constant access to clean water. As the temperature rises, these problems will increase in scale, strength and frequency. Mankind has faced droughts, natural disasters, changes in temperature, fires and floods, which also affect human health. Thus, the climate catastrophe will change everything and there is little time left to affect the nature of these changes and the changes caused by man have already begun.

There is nothing we can do without radically changing our way of life, without abandoning our economy and without losing some of the great industries, and civilization must undergo fundamental changes in values (Voronkova *et al.*, 2020a).

This requires action in line with the economic paradigm of the state, ie focusing on the political steps that states can take, but each of us can help avoid a catastrophe - the head of government, an entrepreneur, an ordinary citizen. The problem is very complex and affects almost every type of human activity. Mankind already has some tools to reduce emissions, but they should be used to the maximum.

Climate change in public policy should be taken into account, focusing on vulnerable categories (women, youth); help farmers reduce the risks of unpredictable weather conditions; create a government program to

diversify the cultivation of crops and animals; help reduce the risks posed by climate change; find new resources to finance adaptation projects; use geoengineering at the local level; stop emitting greenhouse gases into the atmosphere; pursue sound public policies to help address global warming, air pollution and other global issues; develop a program of adaptation to the effects of climate change (Meadows *et al.,* 2018).

The Parties to the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and the Paris Agreement (2015) recognize that adapting to global climate change in the light of the UN Framework Convention on Climate Change is a global challenge affecting all local, regional, national and regional and internationally. Adaptation is a key component of a long-term global response to climate change to protect people, livelihoods and ecosystems. The UN Climate Change Adaptation Cycle includes four key components:

1. Assessing impacts, vulnerabilities and risks. At the present stage, an initial assessment of the degree of impact of climate change on natural systems, as well as society.
2. Planning adaptation measures. Here, the necessary adaptation measures are developed and evaluated, including the study of the necessary costs and potential benefits. This is necessary to choose the best of the available options. Carrying out comprehensive planning is designed to prevent duplication of measures, their incomplete implementation, as well as to promote sustainable development.
3. Implementation of adaptation measures. Adaptation measures are implemented at various levels, including national, regional and local. Various tools are used, such as the implementation of projects, profile programs or strategies. This can be both individual measures and integrated approaches that are taken into account in strategic decisions and plans for sustainable development.
4. Monitoring and evaluation of adaptation measures. These steps are taken throughout the adaptation process. The knowledge, information and experience gained can be used to ensure the success of further adaptation measures. Progress in the implementation of measures is taken into account during the monitoring. Evaluation also serves to study the effectiveness of actions (Metelenko and Voronkova, 2021).

4.6. Modern ways to reduce carbon emissions as an indicator of success

Reducing carbon emissions by 2030 and reaching 0 on balance is a great global ambitious goal of our time, which cannot be achieved without the use

of modern technology. If we aim to reduce emissions a bit by 2030, we are focusing on measures that could complicate or even break the main goal - zero balance. For example, by reducing carbon emissions by 2030, there is a temptation to replace coal-fired power plants with gas-fired ones, and this will actually reduce carbon dioxide emissions (Klein, 2016). Only every thermal power plant built in the next 10 years will still be in operation and produce greenhouse gases in 2050.

She has to work for decades to pay off. That is, the country will fulfill the item "cut to 2030", but will lose the chance to "get to zero". On the other hand, if we consider "reducing to 2030" as an intermediate stage in reaching "zero in 2050", it is pointless to waste time and money on the transition from coal to gas.

It is better to combine two strategies: to focus on affordable and reliable supply of carbon-free electricity and ensure maximum electrification - cars, industrial processes, heat pumps, as electricity is still produced from fossil fuels. If the country is interested in purely reducing emissions by 2030, this approach will be a complete failure. In 10 years, the figures will decline, but countries will build a bridgehead for long-term success, and every breakthrough in generation, storage and supply will rapidly bring humanity closer to zero (Woomeck and Voronkova, 2019).

Therefore, if experts are looking for a measure of who is successfully resisting climate change and who is not, it is necessary to judge not only by reducing emissions. We should look for countries that are preparing a bridgehead to zero, which may not be showing effective emission reductions at the moment, but deserve praise for choosing the right trajectory. And if countries start today with the power of science and innovation, they will have a chance not to make the same mistakes.

The key is to apply innovations that serve a new method or process, but they demonstrate the ability to offer new approaches to business models, supply chains, markets and regulation that will help the invention come to life and be realized worldwide. Innovation is new tools and new ways of doing things (Voronkova *et al.*, 2021c).

Mankind already has a number of competitive low-carbon solutions at its disposal, but there are not enough of them to achieve zero global emissions. It is necessary to use new technologies that will improve ways to reduce carbon emissions and serve as an indicator of success:

1) carbon-free hydrogen production;

2) batteries that can store energy for the city for the whole season;

3) electric fuel;

4) improved biofuels;

5) carbon neutral cement;

6) carbon neutral steel;

7) carbon neutral fertilizer;

8) a new generation nuclear reactor;

9) nuclear fusion;

10) carbon capture (directly from the air and point);

11) underground power lines;

12) carbon neutral plastic;

13) geothermal energy;

14) hydroaccumulation;

15) accumulation of thermal energy;

16) carbon neutral substitutes for palm oil (Hrem and Yorhen, 2017).

To this end, 1) funding for applied research and development in the field of clean energy and climate should be increased fivefold; 2) bet more on ambitious but risky research; 3) cooperate with the industry; 4) build appropriate infrastructure; 5) change the rules of the game so that new technologies become competitive; 6) set the price for carbon; 7) develop the Renewables Portfolio Standard; 8) develop standards for clean fuel; 9) develop standards for clean products; 10) speed up the process of legislative incentives for taxation and regulation of energy companies; 11) use an integrated approach to accelerate innovation. The path is difficult but reliable (Voronkova *et al.,* 2021c).

4.7. The European Green Deal as a set of policy initiatives put forward by the European Commission with the common goal of making the European continent climate-neutral by 2050

The European Green Deal is a set of policy initiatives put forward by the European Commission with the common goal of making the European continent climate-neutral by 2050 (Voronkova *et al.*, 2021b). Modern civilization depends on extraction, devastating the exhaustive deposits of combustible minerals that will not recover even for a longer period of time than our species exists.

Big companies and free market ideology are blocking already uncertain attempts to combat climate change. Provision of fossil fuels and electricity and their use is the biggest cause of anthropogenic pollution. Of course, the combustion of any combustible minerals involves the oxidation of carbon, resulting in CO emissions. Water pollution is mostly the result of accidental spills of oil or acid my water.

The main changes in water use are caused by surface coal mining, construction of large hydroelectric dams and the formation of reservoirs, and more recently the construction of large areas for wind and solar energy. Most of the current laws and regulations protecting the environment have been developed without taking into account climate change. The challenge of reaching a climate consensus is the difficulty of international cooperation.

It is difficult to reach unanimity from all countries of the world, especially when it comes to the additional costs of stimulating carbon emissions. Hence the extraordinary value of the Paris Climate Agreement: more than 190 countries have pledged to limit their emissions. If everyone keeps their word, by 2030 emissions will fall from 3 to 6 billion tons per year, which is less than 12% of current levels. We already know the number of emissions - 51 billion a year (Voronkova *et al.,* 2021b).

The problem is very complex and affects almost every type of human activity. We already have some tools to reduce emissions, so they should be used to the maximum, and this requires many discoveries and technologies. Thus, hundreds of innovative ideas in science and technology are needed to overcome this problem (Trusova *et al.*, 2021). A global consensus needs to be reached and a political course needs to be developed to drive change.

It is necessary to get rid of the shortcomings of the modern energy problem and preserve its advantages. Decarbonize the grid, making extensive use of clean energy sources and investing in advanced developments and technologies for generating, storing and transmitting electricity. Government regulation and funding need to fill this gap by focusing on areas where new carbon-free technologies need to be invented. Independent political and financial support will unlock the potential of the idea (Cherep *et al.*, 2019).

Thus, the government's task is to invest in applied research that will help solve this complex problem at both the center and regional levels. This will help innovations that will reduce the cost of carbon-free steel production. Barriers arise from a lack of staff information or incentives - and this is where good public policy can change the situation. Markets, technology and legislation are the three levers that can separate humanity from fossil fuels, which should complement each other and, therefore, stimulate innovation, the emergence of new companies and the rapid entry of new products into the market.

And to do this, build an infrastructure that will bring new technologies to market; develop standards for clean electricity, clean fuel, clean products. Develop the European Green Course; local initiatives within the European Green Course; implement the Roadmap for Ukraine's participation in the European Green Course; to promote climate change in the framework of the European Green Course and to adapt to the effects of climate change;

prepare the regulatory framework and market structures by 2030; implement an integrated approach to accelerate innovation in Ukraine and around the world (Voronkova *et al.,* 2021c).

The Kyoto Protocol is an international agreement to limit greenhouse gas emissions. The main purpose of the agreement: to stabilize the level of concentration of greenhouse gases in the atmosphere at a level that would not allow dangerous anthropogenic impact on the planet's climate system.

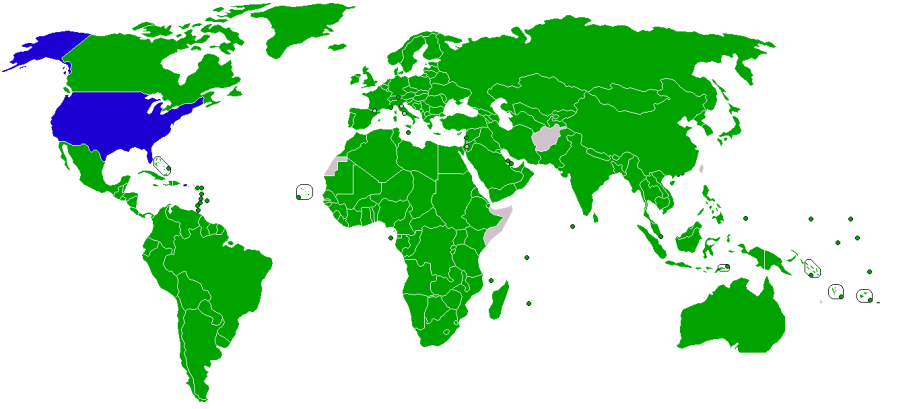

Figure 1 - Member States of the Kyoto Protocol (marked in green).
Source: (United Nation, 1992).

Conclusions of the study

Current trends on Earth are not sustainable, and the traditional answers to these problems usually depend on the type of economic growth that is strongly associated with the additional consumption of resources. Being combined with the continued growth of the population, this fact deprives further today's trends of sustainability. The inevitable result of this process is local and global economic collapse that will completely eradicate the Sustainable Development Goals.

The Declaration accompanying the Goals formulates a vision for the future where the development and use of technology shows its resilience, taking into account climate change, respecting biological diversity. A world in which humanity lives in harmony with nature and in which wildlife and other biological species are protected.

- **Practical recommendations**

Introduce a new taxation philosophy that rewards job creation and fines the consumption of natural resources, while continuing to respect the need for everyone to have access to the resources they need. It is necessary to investigate the consistency between the Goals and the methods by which the stated goals will be realized:

1) the need for urgent action to combat change in goals;
2) the importance of maintaining and moderately using the oceans, seas and marine resources in the context of sustainable development;
3) protecting, reproducing and promoting the sustainable use of land ecosystems, sustainable forest management, combating environmental devastation; stopping land degradation and restoration, as well as halting biodiversity loss. The problem of socio-economic deficits will be addressed by attempts to accelerate growth and trade.

- **Prospects for further exploration in this direction**

Sustainability improvement should be developed as a compromise between socio-economic and environmental goals that will contribute to the achievement of food security, providing humanity with sufficient water, overcoming the effects of biological diversity, and achieving human well-being.

The Human Development Index is a composite indicator of education, health per capita, and is used to measure people's well-being in different countries. However, there is no country in the world that demonstrates a high socio-economic level (the Human Development Index) and at the same time has reached stable indicators (less than 1.8 ha) when measuring its environmental footprint.

This means that there is no country in the world with a high level of productivity on all three pillars (economic, social and environmental).

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CUESTIONES POLÍTICAS

Vol.41 Nº 77

Esta revista fue editada en formato digital y publicada en abril de 2023, por el ***Fondo Editorial Serbiluz, Universidad del Zulia. Maracaibo-Venezuela***

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