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“CLIMATE CHANGE, ENVIRONMENTAL PROTECTION AND THE REBSP: RELATING RIGHTS AND OBLIGATIONS”

Miguel Ángel Ramiro Avilés

Instituto de Derechos Humanos Bartolomé de las Casas. Departamento de Derecho Internacional, Eclesiástico y Filosofía del Derecho. Universidad Carlos III de Madrid

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CLIMATE CHANGE, ENVIRONMENTAL PROTECTION AND THE REBSP: RELATING RIGHTS AND OBLIGATIONS*

Miguel Angel Ramiro Avilés
Instituto de derechos Humanos “Bartolomé de las Casas”
Universidad Carlos III de Madrid

What was made by people also can be changed by people
Ulrich Beck, *The Risk Society*

1. Introduction

Imagine if breakthrough energy technologies were developed and diffused globally, permitting economic and social development without worsening climate change. We will be living in Ecotopia, the ideal society described by Ernest Callenbach in his eponymous novel. We can see in this novel that although ecotopians have restored a more primitive way of life, the use of some technological devices and tools has not been completely abandoned because they are helpful in order to get a sustainable and *green* society. The *stable-state system* described in *Ecotopia* is a perfect balance between human beings and environment, and there are impressive means to pursue their ideal of pollution-free sources of energy, such as solar energy, earth heat, tides and wind, which not affect biosphere (Ramiro Avilés, 2001).

This imagined ecological and sustainable future is attainable and is within our reach, but this *eutopia*¹ will not be reached by the *invisible hand*. There will be required some man-made institutional changes based on the provision of global public goods, such as scientific knowledge and technological applications, that will restructure relationships

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¹ The *dystopian* scenario would be perfectly described through the list of impacts on climate and the list of risk of abrupt and irreversible changes included in the Fourth Assessment of the Intergovernmental Panel on Climate Change (Report, 2007, 48, 53).

among countries, making possible a multilateralism policy in environmental issues. These global public goods are crucial for the future of the world integration and interdependence, and a new management of globalization based on human right requires understanding and shaping their provision (Kaul *et alii*, 2003, 2). Our wellbeing and the wellbeing of the next generation (people who are now children) and the future generations (which do not overlap our own) depends on the provision of clean technologies to prevent or mitigate climate change. As Scott Barret states, «failure to supply these global public goods exposes the world to great dangers. Providing them expands human capabilities» (Barret, 2007, 1).

2. Climate Change

The climate is a complex, balanced and dynamic system of interactions between the Earth's atmosphere, hydrosphere, biosphere and geosphere, and it is suffering tremendous changes because human activities, which have been substantially increasing the atmospheric concentrations of greenhouse gases. As stated in the Fourth Assessment of the Intergovernmental Panel on Climate Change, «changes in the atmospheric concentrations of greenhouse gases, land cover and solar radiation alter the energy balance of the climate system and are drivers of climate change. They affect the absorption, scattering and emission of radiation within the atmosphere and at the Earth's surface. The resulting positive or negative changes in energy balance due to these factors are expressed as radiative forcing, which is used to compare warming or cooling influences on global climate» (Report, 2007, 37). These alterations enhance the natural greenhouse effect and they will produce an additional warming of the Earth' surface and atmosphere adversely affecting natural ecosystems and humankind.

Changes in the climate system can be produced by natural causes or by human activities, as stated by the Fourth Assessment of the Intergovernmental Panel on Climate Change. Climate change is defined as «change in the state of the climate that can be identified (eg. Using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or

as a result of human activity» (Report, 2007, 30)². In the first case, for instance, we know that a long, long time ago continental drift had an impact on the climate because it changed the physical features of the landmasses, their position and the position of water bodies. The separation of the landmasses changed the flow of ocean currents and winds, which affected the climate. This drift of the continents continues even today because we know that the Himalayan range is rising by about 1 millimetre every year because the Indian landmass is moving towards the Asian one. This kind of climate change is *natural* and it is senseless to ask about justice, responsibility or violation of rights. Human beings using scientific methods can predict the conduct, the pattern and the rules of this natural climate change in order to avoid some of the bad consequences (i.e. earthquakes). Historically societies have a long record of adapting and reducing their vulnerability to natural impacts on weather and climate related events. Trying to discover the *rule of nature* it has been a constant factor in the history of the science in order to predict the unpredictable and to avoid some uncertainty from our lives.

But some others climate changes are *artificially* produced by the action of human beings³. Artificial climate change is not a brand new topic in the history of humankind because since the Industrial Revolution there is a large-scale use of fossil fuels for industrial activities and some authors denounced the shadows of the blind belief in progress (i.e. William Morris) because, according to the second law of thermodynamics as formulated in 1852 by Sir William Thompson, the sum of useful energy throughout the universe would be constantly reduced by the diffusion of heat until all had reached a state of entropy (Kumar, 1987, 175). The industrial revolution, based on the enlightenment's faith in progress and science, promised the creation of a full employment society, material abundance, amelioration of social conditions but they also produced, from the point of view of the environment, consumerism and mountains of waste.

The largest share of historical and current artificially made global emissions of greenhouse gases has been originated in developed countries over the last three decades, which, as we will see below, have different responsibilities. Despite the long history of

² This *technical* definition differs from the *legal* definition included in the UN Framework Convention on Climate Change, where climate change is attributed directly or indirectly to human activities that alter the composition of global atmosphere (Report, 2007, 30).

³ See the Schematic framework of anthropogenic climate change drivers, impacts and responses (Report, 2007, 26).

environmental debate, the 20th and 21st centuries have seen more debate surrounding climate change than any other period in modern history. We are witness of an unprecedented increase in legal claims for both human rights and environmental goods. Although human right and environment rights have not historically arisen from the same legal source, they have been interconnected in order to get protection for both. It is likely that legal historian writing in the last decade of the 21st century will look back and see 1992-1997 as the period in which both environment and human rights reached a kind of maturity and omnipresence.

The reports of the Intergovernmental Panel on Climate Change, with a mandate to assess the emerging science of climate change, document how global warming due to the greenhouse gas emissions will affect, and already is affecting, the basic elements of life for millions of people all around the world. Effects include an increasing frequency of extreme weather events, rising sea levels, droughts, increasing water shortages, and the spread of tropical and vector born diseases. Although there are still important uncertainties over the timing, rate and impact of climate change, these do not challenge the fundamental conclusion that human-induced climate change is real. In this sense, the *Fourth Assessment Report* of the [Intergovernmental Panel on Climate Change](#) put it beyond doubt that the global climate system is warming mainly because of man-made greenhouse gas emissions. We can read in this report that anthropogenic warming over the last three decades has likely had a discernible influence at the global scale on observed changes in many physical and biological systems. Warming is very unlikely to be due solely to natural variability of temperatures or natural variability of the systems (Report, 2007, 41). The scientific community is warning of the potentially serious effects of climate variability caused by the action of human beings. These serious man-made effects over the climate system will have profound and negative consequences for very aspect of human society. When climate change is caused by human beings, we have to ask about justice, responsibility and human rights.

Greenhouse gas emissions are interconnected to knowledge improvement, scientific innovations and technological applications both in negative and positive ways because scientific progress has created the *Golem* and scientific progress can eliminate it. We are living in a world of shared risks but also of common opportunities. We are living in the *risk society*, as Ulrich Beck has defined our context. «We were previously concerned

with *externally* caused dangers (from the gods or nature), the historically novel quality of today's risks derives from *internal decision*. They depend on a simultaneously scientific and social construction. Science is *one of the causes, the medium of definition and the source of solutions* to risks (...) The sciences are now being confronted with their own objectivized past and present (...) In that way, they are targeted not only as a source of solutions to problems, but also as a *cause of problems*. In practice and in the public sphere, the sciences increasingly face not just the balance of their defeats, but also that of their victories, that is to say, the reflection of their unkept promises (...) As success grows it seems that the risk of scientific development increase disproportionately faster; when put into practice, solutions and promises of liberation have emphatically revealed their negative side as well» (Beck, 1992, 155-156).

The current debate on the climate change is the result of the advancement in scientific technology (as Beck suggests, we have abandoned the *primary scientization* for the *reflexive scientization*) but also the issues surrounding climate change have been hyperinflated by politics. Climate change is now a top priority in fields of science, business, politics and law. However and whatever the reason, this is not only a political issue but also a moral issue because of two main reasons: (i) if the richest countries gained so much from activities that impose risks on citizens of the poorest countries, it seems clear they have a duty to mitigate the harm or to provide help to those who are likely to suffer it; (ii) we have to protect the most vulnerable people, the next and the future generations, against risk to their safety and health.

3. Environmental protection

We are facing a global issue and most of the countries have adopted a political position on this issue. It is through international protection that the global environmental problems are mainly managed because acting alone no country can hope to arrest climate change, but collective and cooperative actions by States with diverse interests are difficult to take. As we will see below, the climate can not be protected by one Single Best Effort but by Aggregate Efforts.

In the last 25 years the number of international legal instruments, their sophistication, and the number of states has exponentially grown⁴. One of the lessons we can learn is that simply negotiating an agreement may not be sufficient to address an environmental problem. We have also to keep in mind that no state can ever be required to join an international agreement or to undertake a particular regulation (DeSombre, 2007, 7). The international system is, using Thomas Hobbes' theory on the social contract, «such a war as is of every man against every man» because there is not overarching authority that can dictate to states what they must to do, and although there are international courts no state has been ever forced to appear before them or to accept punishment from them.

However, this lack of a world government has some positive outcomes because it means that states must cooperate if they want to face climate change. Cooperation means that they want to make environmental policies on the international level and they must be willing to comply with these policies (DeSombre, 2007, 7). Seeing climate as a global public good means that international cooperation is required in order to protect it. Environmental issues require a global cooperation because it calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their *common but differentiated responsibilities* and respective capabilities and their social and economic conditions.

Common but differentiated responsibilities. It is interesting to underline the relevance of the principle of “the common but differentiated responsibilities” because it has been adopted in many legal instruments and documents focused on climate change, and, as we will see below, financial issues concerning global public goods will be also affected by this principle. This principle refers to «the use of norms that provide different, presumably more advantageous, treatment to some States» (Rajamani, 2006, 1). Christopher Stone says this principle «puts a fresh label on a longstanding practice». The idea is that «some countries should contribute more than others to the provision of global public goods, usually but not inevitably divided along a Rich-Poor axis» (Stone,

⁴ By the time of the UN Conference on Environment and Development in 1992 (Rio Conference) there were more than 900 instruments of international cooperation addressing protection of the environment (DeSombre, 2007, 8).

2004, 299). In this sense, developed countries should take the lead in addressing the climate change issue.

Although certain risks affect every nation on earth, not all nations should contribute economical and technological equally. It could be said this principle is based on a notion of fairness because some countries have been historically and are nowadays more responsible than others for global environmental problems (Harris, 1999, 28-30). «It would be unfair to expect developing countries to limit their economic development when wealthy countries are most responsible for present concentrations of atmospheric greenhouse gases *and* the expected consequences of this pollution for the global climate in the next century» (Harris, 1999, 32). This principle reflects that formal equality is insensitive to global political and economic realities because most of the developed countries went through economic development in a years when the negative environmental effects of industrialization were not really considered. Common but different responsibilities is therefore a legal and moral mechanism to address the inequalities and resulting unfairness (Heyvaert, 2009).

A bit of history. International action to address environmental policy has been fruitful since its beginnings (DeSombre, 2007, 8). Early environmental protection was related to protect wildlife. One of the most significant treaties was the *Fur Seal Convention*, signed in 1911 by United States, United Kingdom, Japan and Russia, which attempted to adopt effective means for the preservation and protection of the fur seals which frequent the waters of the North Pacific Ocean using biological indicators to make sure that seals were not over-harvested. The modern era, according to DeSombre, starts with the 1972 UN Conference on the Human Environment, which attempted address (i) the collective human responsibility for environmental protection on a global scale and (ii) the idea that environmental protection was important for social and economic development. The main outcomes of this conference were the Declaration on the Human Development, an action plan for its implementation and the creation of the UN Environment Programme. The 1972 UN Conference on the Human Environment inspired the negotiation of several international environment treaties addressing specific issues such as acid rain, ocean dumping, regulation and trade of endangered species, and the protection of the wetlands. As Elizabeth DeSombre suggests, «these treaties primarily reflected the concerns of the developed countries that initiated their

negotiations» (DeSombre, 2007, 9). For many years environmental problems were almost exclusively considered from the standpoint of the pollution in the industrialized countries (Report, 1994, para. 6).

The next step was the treaties concerning global commons international environmental problems, in which the problematic issues of developing countries had some room (i.e. the transboundary movement of hazardous waste). The 1987 Convention for the Protection of the Ozone Layer and the 1987 Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) included measures to help address the development concerns of non-industrialized countries. Since then, environmental issues began to be seen as global issues. The environmental disaster affects to all countries, rich or poor, and all would have to be involved in the prevention of these problems (De Sombre, 2007, 8-10).

In 1988 the UN General Assembly took up the issue for the first time and adopted the resolution 43/53, declaring climate change to be «a common concern of mankind». In this resolution and other resolutions focused on climate change, the UN General Assembly declares that certain human activities could change global climate patterns, threatening present, next and future generations with potentially severe economic and social consequences. Although it is recognized that is needed additional research and scientific studies into all sources and causes of climate change, it is declared that there is an emerging evidence indicating that continued growth in atmospheric concentrations of greenhouse gases could produce global warming and the effects could be disastrous for humankind if timely steps are not taken at all levels. Climate change is a common concern of humanity, since climate is an essential condition which sustains life on earth, and this issue should be confronted within a global framework. In this sense, it is required among other things an internationally coordinated political action by the governments of develop and developing countries, intergovernmental and non-governmental organizations, industry and scientific institutions in order to (i) prevent detrimental effects on climate and activities which affect the ecological balance, (ii) increase understanding on all sources and causes of climate change, including its regional aspects, and (iii) contribute with human and financial resources to efforts to protect the global climate.

The 1992 UN Conference on Environment and Development addressed the intersection of environment and development. This new attitude tackles the issue from a universal angle, involving a global economic, social and cultural approach to which it adds the human right to a healthy and balanced environment and to “sustainable development” (Report, 1994, para. 7). It was declared the idea that the needs of the undeveloped and developing countries should be given special priority and that developed countries bore a special responsibility for working towards sustainable development. «Sustainable development, we recall, revolves around the premise that environmental protection and development -whether of an economic or social nature- can and should go hand-in-hand. Environmental protection ought not to be conceived as a limit to growth, but as a condition of sustainable growth. Sustainable development pursues an agenda of intergenerational equity, in that the needs of the present should be met without compromising the ability of future generations to meet their own needs» (Heyvaert, 2009, 5). The implementation of the 1992 UN Conference on Environment and Development through the action plan, called Agenda 21, reiterated (i) states’ rights to sovereignty over their natural resources; (ii) states’ rights to development; (iii) the “polluter pays” principle; and (iv) the precautionary principle. More recently some treaties have included funding mechanism and provisions for transfer technology. This last point will be very important in our argument because the transfer of technology will be considered as part of the right to enjoy the benefits of scientific progress and its applications.

The implementation also meant the adoption of two major international treaties: the 1992 UN Framework Convention on Climate Change and the 1997 Kyoto Protocol. These legal instruments constitute nowadays the core of the international climate regime and they are as intricate as the climate problem itself (Yamin & Depledge, 2004, 2) because both newcomers to the climate issue (as myself) and those familiar with the international climate regime find it difficult simply to follow the trail of documents and their significance. As Yamin and Depledge state, «rules governing aspects of the climate regime have become even more technical and specialised, producing experts on individual topics but few who have an overall understanding of the complete picture» (Yamin & Depledge, 2004, 2).

The major distinction between the Protocol and the Convention is that while the Convention only *encouraged* industrialised countries to stabilize greenhouse gas emissions, the Protocol *commits* them to do so. The Kyoto Protocol sets binding targets for 37 industrialized countries and the European Union for reducing greenhouse gas emissions: an average of 5% against 1990 levels over the period 2008-2012. Likewise, recognizing that developed countries are principally responsible for the current high levels of greenhouse gas emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities”.

Despite the critics (Victor, 2001), the Kyoto Protocol is generally seen as an important first step towards a truly global emission reduction regime that will stabilize greenhouse gas emissions, and provides the essential architecture for any future international agreement on climate change. By the end of the first commitment period of the Kyoto Protocol in 2012, a new international framework will have to be negotiated and ratified.

A bit of legal positivism. Articles 2 and 3 of the Convention set out the “ultimate objective” and the principles. As Yamin and Depledge state, «article 2 provides overall guidance for the basic values and scientific orientation for the climate regimen» and article 3 «provides guidance bearing more directly on implementation of the commitments Parties have accepted under the regime and their evolution» (Yamon and Depledge, 2004, 60). The ultimate objective of the Convention is the «stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system» and it has to be reached «within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner». It means that (i) limits are established by the Earth; (ii) the ultimate objective is preventive; (iii) focus its attention on the anthropogenic interference, so it will be necessary *detection* of the problems and *attribution* of responsibility; and (iv) the dangerous interference has to be interpreted according to the precautionary principle.

The principles stated in the Convention are (i) environment is a common concern of humankind, any change in the climate affects all humankind, present, next and future

generations, so all the States have a interest in the climate system, including legal responsibility to prevent damage on it; (ii) States have a sovereign rights over their natural resources but they do not have a right to damage to the environment of other states; (iii) States have common but differentiated responsibilities, so certain problems affect all nations in common but in different degree, responsibilities must be differentiated because not all the nations (developed or developing) are going to contribute equally to alleviate the problem; (iv) precautionary principle provides guidance in cases where there is scientific uncertainty or where risks are unknown, so this uncertainty cannot be used as a reason to not prevent serious and irreversible environmental damages; (v) right to sustainable development means preserve natural resources, explore such resources in a sustainable manner, balance one state's use with needs of others in an equitable manner, and integrate environmental consideration into economic and social development, (vi) measure to combat climate change should not constitute a means of arbitrary discrimination or restriction of international trade.

The commitments are found in article 4 of the Convention and can be divided into substantive (require action to control greenhouse gas emissions) or procedural (focus on the preparatory efforts to address climate change), and also can be divided according to the different countries (developed, developing, dependent on the production/consumption of fossil fuels, with an economy in transition). Some of these commitments can be achieved through flexible mechanisms, such as joint implementation, emissions trading and Clean Development Mechanism (art. 3 Protocol). Some of these commitments are closely related to the enjoyment of the benefits of scientific progress because they are binding to developed countries (i) to promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and process that control, reduce and prevent anthropogenic emissions of greenhouse gases; (ii) to promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences; (iii) and to promote and cooperate in the full, open and *prompt* exchange of relevant scientific, technological, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences.

The precautionary principle. It is interesting underline that the precautionary principle and the commitments related to the transfer of technology may have a difficult relationship because the most common interpretation of the precautionary principle can lead to limit or to ban some technological innovations and scientific research because casual connections cannot be described with certainty. The precautionary principle, according to this, means that until safety is well established, we have to be cautious and avoid steps that will create a risk of harm. This principle can be seen as useful protecting human right and environment but it also could have some negative implications if it is interpreted in a strong way.

The precautionary principle has been adopted as part of customary international law and it is possible to track his presence in many international legal documents, such as the 1982 UN World Charter for Nature and the 1997 EU Treaty of Amsterdam. The precautionary principle is used to resolve disputes that are scientifically contested and the classic method of *trial and error* is not acceptable because of the consequences of the errors (imminent, irreparable and /or serious damages). The normative influence of this principle is due to five reasons, as Cass Sunstein explains: (i) loss aversion and familiarity: «people dislike losses far more than they like corresponding gains» and «people are far more willing to tolerate familiar risks than unfamiliar ones, even if they are statistically equivalent»; (ii) the myth of benevolent nature: «safety and health are generally at risk only or mostly as a result of human intervention», (iii) the availability heuristic: «people focus on some risks because they are cognitively ‘available’, whereas other risks are not», (iv) probability neglected: «sometimes the issue of probability is neglected and people focus on one emotionally gripping outcome among a large set of possibilities» and «people invoke the principle to favor stringent controls on a low-probability risk, even though the consequence of those very controls is to give rise to new risks of equal or greater probability», (v) system neglect: «people neglect the systemic effect of one-shot interventions [and] assume that a change in a social situation will alter the part at issue, but without altering other parts» and «ordinary people are paying attention to the harms but not the benefits» (Sunstein, 2003, 1008-1010, 1037-1054).

This principle is very important in order to justify some risk-based legislation because there is no need to prove an actual harm or breach of the human right to protect it. Stringent conditions, such as imminent, irreparable and /or serious damages, are good reason to justify protection (Fiorletta-Leroy, 2006, 70). There should be no need to wait for a real harm or damage to incite States to take appropriate precautionary or interim measures⁵. But we need to find an operational definition of the precautionary principle because, as Cass Sunstein states, although we have good reason to endorse the goals that motivate many people to endorse the precautionary principle, some of the effects are deeply negative. Certainly, it is important to protect environment even from remote risk, to attend unintended adverse effects of technological change, and need to ensure that developed countries pay their fair share for environmental improvement and risk reduction. «In situations where potential violations flow from uncertain harm to the environment, the precautionary principle should apply (...) the impacts on, and the vital importance of, the rights threatened should encourage the application of the precautionary principle to link threats to the environment and threats to human rights in applying interim measures in relation to the human rights that may be violated if the environmental harm occurs» (Fiorletta-Leroy, 2006, 71). The problem, according to Sunstein, is that the precautionary principle «is a crude way of protecting these goals» (Sunstein, 2003, 1004-1005). He distinguishes between a weak version of the precautionary principle and a strong version of the precautionary principle (Sunstein, 2003, 1016).

The strong version suggests, according to Sunstein, that stringent regulation is required «whenever there is a possible risk to health, safety, or the environment, even if the supporting evidence is speculative and even if the economic costs of regulation are high» (Sunstein, 2003, 1018). As we have seen, ordinary people focus his attention on some risks, because they are cognitively ‘available’, whereas benefits and other risks are not, and they dislike to run a small risk of a large loss or a serious harm, even if a

⁵ The key vulnerabilities in climate change are described in the Fourth Assessment of the Intergovernmental Panel on Climate Change (Report, 2007, 64-65): risks to unique and threatened systems (polar and high mountain communities, extinction of species, coral reef damages), risk of extreme weather events (droughts, heat waves and floods), distribution of impacts and vulnerabilities (the weakest economic position is the most susceptible to climate-related damages), aggregate impacts (net market benefits from climate change are projected to peak at a lower magnitude and the net costs of impacts of increased warming are projected to peak at a higher magnitude) and risks of large-scale singularities (a large-scale abrupt change in the meridional overturning circulation is *very unlikely*, but there is *high confidence* that global warming over many centuries would lead to a sea level rise).

structured analysis of the risks not justify the adopted measures. Cass Sunstein shows us that the most serious problem with the strong version of the precautionary principle is that it offers no guidance because it will be offended by regulation as well as by non regulation (Sunstein, 2003, 1020- 1024). In this case, if the strong version is used, some scientific research and technological applications will be banned because uncertainty cannot be reduced to zero, though they could have a positive impact on environment.

The weak version, instead, demands a structured analysis of the risks and it is useful «to combat public confusion or the self-interested claims of private groups demanding unambiguous evidence of harm, which no rational society requires» (Sunstein, 2003, 1016). This weak version admits that risk and uncertainty cannot be reduced to zero and the measures should be proportional to the chosen level of protection. In this case, the recourse to the precautionary principle presupposes the identification of potentially negative effects alongside a scientific evaluation that shows inconclusive or imprecise data. «For the weak version, a principal current task is to find ways to match the extent of the evidence with the extent of the response. Weak evidence of harm, for example, might merely support further research, whereas somewhat stronger evidence might support public disclosure of the risk, and still stronger evidence might support regulatory controls» (Sunsteins, 2003, 1018).

The weak version can be used against those who suggest that «until we are sure that global warming is really a problem, we should not take any steps that would have economic costs» (Sunstein, 2003, 1016-1017). In this sense, the weak version of the precautionary principle can be used «as a way of emphasizing the importance of attending to issues, especially environmental issues, that might otherwise be neglected» because of the lack of scientific certainty or scientific proofs (Sunstein, 2003, 1030). Environment is a situation in which we cannot eliminate or reduce uncertainty to zero, but if we do not address this problem right now, maybe we will arrive too late. The weak version of the precautionary principle remind us that most of the times existing knowledge does not allow us to establish a clear assessments of the full range of adverse effects but we have to face this uncertainty and pursue some course of action.

Cass Sunstein states that such approach «would attempt to counteract, rather than to embody, the various cognitive limitations that people face in thinking about risks. An

appreciation of the difficulties with the precautionary principle suggests the importance of overcoming cognitive limitations by ensuring that people have a full, rather than limited, sense of what is at stake. The result should be to help with cognitive distortions and to produce sensible priority-setting. An effort to produce a fair accounting of the universe of dangers should also help to diminish the danger of interest-group manipulation» (Sunstein, 2003, 1057).

4. Relating Rights and Obligations

How the Framework Convention and the Kyoto Protocol affects rights and obligations? Are these international legal instruments connected to the right to enjoy the benefits of scientific progress? As we know, the right to enjoy the benefits of scientific progress is enshrined in article 27 *Universal Declaration of Human Rights* and in article 15.1.b *International Covenant on Economic, Social and Cultural Rights*. This right is an important challenge for the general theory on human rights since it is necessary (i) to elucidate the normative nature and content, and (ii) to discuss the interdependence and interrelation with others human rights (in my case the protection of environment).

According to the discussion on the interdependence and interrelation of the right to enjoy the benefits of scientific progress and the protection of environment, if we look at the scientific data through a human rights' lens, it is clear that the projected climate change's effects threaten the effective enjoyment of a huge range of human rights. All human rights are indivisible, interdependent and interrelated. Whether they are civil, political, economic, social or cultural rights, they all will be affected by climate change because the deprivation of one right adversely affects the others. In tackling climate change, Governments worldwide must bear in mind that they have not only moral duties but also legal obligations to protect and promote basic human rights enshrined in the *Universal Declaration of Human Rights* and international human rights law. Climate change will affect the basic elements of life for people all around the world and could seriously hinder growth and development, hitting the poorest countries and communities the hardest.

The interdependence and interrelation among human rights is a suitable instrument for the maximum grade of protection of human dignity (Alston, 1993). We should, for this reason, abandon the idea that some rights are not justiciable, because among their

protection clauses the direct demand on court and the individual petition with respect to violations are excluded. Although we have to be aware of the existence of different systems for protection and apart from the utilitarian approach (that sees environmental protection as the essential condition for the full enjoyment of rights), there is a fuller form of justification that see the protection of the environment as inherently valuable consideration irrespective of what he contributes to the enjoyment of civil, political or social rights.

The human right to a healthy environment is an independent human right. It is not only the logical consequence of the expansive interpretation of other human rights, particularly the right to life. The right to a healthy environment involves moral choices of the most profound nature because is connected to human dignity. The environment has a role to play in the realization of human autonomy, human flourishing, self-realization (Merrills, 1996).

Is there a right to a healthy environment? We could say right to a healthy environment is not an independent right because environment is only an instrument to protect and develop some other rights, such as life, protection of health or private life. It could be said, then, it is not a new right emerging from a mutation both of the social circumstances and the axiological system but only an effective instrument for the exercise of legally recognized rights and freedoms. In my opinion, the right to a health environment cannot be only seen as a simple instrument for improving some other rights because both the social circumstances and the axiological system have changed. Some social movements historically excluded from political debate have emerged playing a global role and denouncing the deficiencies of the axiological, social political and economic systems both at the local and global level, demanding a fair distribution of the benefits of scientific progress and technological applications in order to get a better society (Ramiro Avilés, 2009).

The latest decades of 20th century and the first of the 21st century have witnessed the relation between human rights and environment. In 1994 the Final Report of the UN Sub-Commission on Human Rights and Environment explores this relationship indicating that for the particular purposes of the study of human rights and the environment, «it is equally important to establish the legal framework for pursuing what

have become the essential demands of this century, in order to take up the legitimate concerns of our generation, to preserve the interests of future generations and mutually to agree upon the components of a right to a healthy and flourishing environment» (Report, 1994, para. 4). I cannot deeply explore in this paper all the issues related to the right to a healthy environment because when we deal with the definition of the right to a healthy environment, we will find there is a slow academic and legal process in clarifying issues such as content, rightholder and dutyholder and their corresponding obligations (Anderson, 1996). Basically, this right means that everyone has the right to the protection of a human, secure, satisfactory, healthy and ecologically well-balanced environment (Draft Declaration, 1994)⁶. The rightholder is a universal and abstract subject who cannot be specified (present and future generations), though it has to be said that the exercise of the right is collective because we are protecting communal interests. So, when we refer to this right a collective approach is often called, since it can only be enjoyed in community. That is, there is an individual rightholder but the right is implemented by a collective effort. This kind of rightholding is demanding the reinforcement of the responsibility of the international community and the presence of individual subjects and NGOs at the international level, and an increment and expansion of citizens' participation at the local level. The object of protection is a collective interest since through this vindication we are trying to articulate a way to enjoy some common goods.

Regarding the duties of the State in recognizing, protecting and developing the protection of environment, they are related to goals, policies and programmes. So, we have to admit the necessity of setting up systems of legal protection more ductile and flexible. This right will certainly formulate a reason for deciding politically in a certain way and the State will be bound to deliberate about the suitability of its politics with regard to these right claims. In this sense, this right, for instance, will serve as a legal basis for the interpretation and judicial review of the legal texts and public policies. However, as Asbjørn Eide and Allan Rosas have said, «it [is] essential that the concept of right is included in such goals and programmes» because «fundamental needs should not be at the mercy of changing governmental policies and programmes, but should be defined as entitlements» (Eide & Rosas, 2001, 6), which ensure an adequate standard of

⁶ See this document to get a fully list of the dimensions of this right.

living and of judicial protection in order to being invoke in courts of law and applied by judges. Rights require the existence of some duty-holders, and the primary responsibility for the realization of human rights rests within the State. Under international law, duties for human rights (respect, contribute, assist, provide, achieve, protect, fulfil, facilitate, provide) are primarily held by States, though, subsidiary some people and public institutions can be obliged and, in some cases, even the obligation could be universal because, when it comes to know what resources are available to the State in order to fulfil the rights, «the question is not what resources are in the hands of the government as compared to privately owned resources but on the total resources of the country as a whole» (Eide, 2001, 27).

Environmental legislation and the human right to a healthy environment will only be effectives if individuals and civil society have a right to obtain environmental information (accountability), to participate in environmental decision-making (transparency) and to redress to the courts (responsibility). In this sense, the protection of environment should enjoy the access to justice. Besides the local and regional legislation and case-law doctrine⁷, the 1998 UN Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) tries to do so. As stated by the former UN General-Secretary, «is the most ambitious venture in environmental democracy undertaken under the auspices of the United Nations». This instrument is widely recognized as the best international instrument promoting access to information, public participation and access to justice in environmental issues. Instrument like this seeks empowering citizens and associations to assume responsibility for the environment. This instrument highlights the importance of public participation and access to justice for the enforcement of environmental law. The origin of the right to access to justice in environmental matters is based in the own idea of democracy because access to justice is an essential instrument in any democratic society for the citizens to effectively

⁷ See Fiorletta-Leroy, 2006, 68-69. She proposes to connect the precautionary principle and the interim measures to protect environment-related human rights because, although their legal and reasoning processes differ, their aim might be similar. In this sense, she states that «human rights bodies could be used to produce interim measures, that, by preserving human rights, go directly to the core of environmental protection (...) In using precautionary approaches, if not the precautionary principle itself, interim measures can be ordered and produce side-effects benefiting human beings and the environment without unrealistically affecting States' resources (...) Protecting the environment should therefore be 'concomitant' with the protection of the human rights in question, not 'separate' from it».

confront violations of law in environmental matters. Members of the civil society should have the right to defend in court the environment as one of the most precious assets of humankind. As Birgit Dette asserts, «allowing citizens or non-governmental organisations to defend the public interest in a healthy environment would reflect the ongoing democratisation of modern pluralistic political system» (Dette, 2004, 4).

Anyway, the full implementation of the protection of the right to a healthy environment demands, in my opinion, a new ethical approach and, probably, a new social, political and economic system which make possible to go beyond reductionist concepts of “humankind first” or “ecology first”. Ecotopia’s images strike again because the current legal instruments do not see this new ethical, social, political and economic system as necessary. In this sense, we can read in the Framework Convention on Climate Change that «economic development is essential for adopting measure to address climate change».

5. The transfer of technology as a global public good.

In the Framework Convention and the Kyoto Protocol are included some commitments, which reinforce the responsibility of the international community, directly related to the right to enjoy of the benefits of scientific progress. These commitments for scientific cooperation and exchange of information and knowledge are necessary in a field like climate change because is of critical importance to the development of *adaptation* strategies as well as the timing of *mitigation*. Nowadays adaptation measures, which are need both in the short and the long term to address impacts, are not enough because can not cope with all the projected effects of climate change, especially not over the long term as most impacts increase in magnitude. Mitigation is also required to «avoid locking in both long-lived carbon intensive infrastructure and development pathways, reduce the rate of climate change and reduce the adaptation needs associated with higher levels of warming» (Report, 2007, 56, 66). But, «no single technology can provide all of the mitigation potential in any sector» (Report, 2007, 58) The nature of climate change impacts requires the development of mitigation and adaptation technologies to combat the adverse effects. Such cooperation and exchange shall be carried out in the light of the best available scientific information, knowledge and assessment on climate change and its impacts. «Worldwide deployment of low greenhouse gas emission technologies as well as technology improvement through

public and private Research, Development and Demonstration would be required for achieving stabilisation targets as well as cost reduction (...) Without sustained investment flows and effective technology transfer, it may be difficult to achieve emission reduction at a significant level» (Report, 2007, 68). The development, application and diffusion of low/zero carbon technology are issues of critical importance in preventing and mitigate climate change, and adaptation technologies are also important to reduce adverse impacts. Since the Third Conference of the Parties in 1997 this technology issue has been considered as part of the conference agenda (Yamin & Depledge, 2004, 201). Both, adaptation and mitigation would involve use of new technologies, techniques and know-how. The Convention and the Protocol require all Parties to cooperate in the development, diffusion and transfer of effective mitigation and adaptation technologies. For this reason the Conference of the Parties look at technologies issues at each of its sessions. In the First Conference was requested «the preparation of an inventory and assessment of environmentally sound and economically viable technologies and know-how conducive to mitigating and adapting to climate change». And there has been organized some technical experts' meetings in order to know how appropriate adaptation technologies can be developed, assessed and made available to developing country Parties in the short, medium and long terms, including an examination of the conditions necessary for such efforts to succeed. In 1999 a paper prepared by the Subsidiary Body for Scientific and Technological Advice⁸ noted that coastal adaptation strategies should incorporate soft engineering approaches, as well as planning and institutional measures, and that further work on such technologies should be considered as part of the transfer of technology consultative process. After that, it is possible to affirm that the Convention and the Protocol mandate technological transfer from Parties with more resources to those less well endowed and more vulnerable. Developing countries will need new technologies in order to progress towards the goals of the Frame Convention on Climate Change and the Kyoto Protocol.

The developed countries shall take all practicable steps to promote, facilitate and finance the transfer of, or access to, environmentally sound technologies and know-how to the developing countries to enable them to implement the provisions of the

⁸ It was created (i) to provide timely information and advice on scientific and technological matters relating to the Frame Convention, (ii) provide assessment of the state of scientific knowledge relating to climate change and its effects, (iii) identify innovative, efficient and state-of-the-art technologies and know-how and (iv) advise on the ways and means of promoting development and/or transferring such technologies).

Framework Convention on Climate Change, and they shall also support the development and enhancement of endogenous capacities and technologies of developing countries. An environmental sound technologies are «technologies that have the potential for significantly improved environmental performance relative to other technologies». These technologies protect the environment, are less polluting, use resources in a sustainable manner, recycle more of their wastes and products, and handle all residual wastes in a more environmentally acceptable manner than the technologies for which they are substitutes (Yamin & Depledge, 2004, 306-307).

Protection of the environment is therefore a matter of better technology and, obviously, technology, and its transfer, is a politically charged issue. Negotiations between developed and developing countries have taken place since 1990 because transfer of technology is closely connected to the protection of intellectual property (TRIPS). The transfer of technology should be evaluated from the point of view of the public goods because knowledge is the most public of all public goods because «it is strongly nonrival, and its benefits cut across many issues of public concern», but some types of knowledge, notably knowledge with potential commercial value, «are not in the public domain but instead are made exclusive through instruments such as intellectual property» (Kaul *et alii*, 2003, 22). The challenge is to strike a balance between promoting the broader use of knowledge and providing incentives to generate more knowledge and technological applications (Kaul *et alii*, 2003, 45).

Supplying the public good of knowledge is necessary in order to fight against climate change because we need to undertake research and development into breakthrough green energy technologies, which once discovered must be diffused all around the world. The problem is that traditionally some knowledge and technological applications are seen as private goods but, as we will see below, according to the expanded definition of public goods can be transformed into public goods as a result of a deliberate policy choice.

What are global public goods? Public goods are those that are non-rival in consumption and have non-excludable benefits; private goods, by contrast, are those «that are rival in consumption and that have excluded benefits» (Kaul & Mendoza, 2003, 79-80). Global public goods are non-excludable and non-rival because once provided, no country can

be prevented from enjoying them nor can any country's enjoyment of the good impinge on the consumption opportunities of other countries (Barret, 2007, 1). Nonexcludability means that it is technically, politically, or economically infeasible to exclude someone for consuming the good; nonrivalry means that one person's consumption of the good does not detract from its availability to others (Kaul *et alii*, 2003, 21-22). This kind of goods are in the *public domain* because they are «available for all to consume and so potentially affecting all people (...) with benefits that extends across countries and regions, across rich and poor population groups, and even across generations» (Kaul *et alii*, 2003, 3).

It is necessary to take into account that nonrivalry and nonexcludability are properties of these goods but they are not natural or inherent to them because «the society can modify the (non)rivalry and (non)excludability of a good's benefits». Goods often become private or public as a result of deliberate policy choices (Kaul & Mendoza, 2003, 80). As Kaul and Mendoza state, although it is assumed that a nonrival and nonexcludable good must be public, and that a rival and excludable good must be private, «before goods appear in the market or in the portfolio of state agents, policy choices have been made or norms established to make the goods private in the sense of being exclusive or public in the sense of being nonexclusive» (Kaul & Mendoza, 2003, 86). This is an *expanded definition* of public goods and global public goods because «the challenge is to define public goods in a way that does not leave the task of identifying “public” and “private” solely to the market but also involves the general public and the political process» (Kaul & Mendoza, 2003, 87). According to this expanded definition, «goods are de facto public if they are nonexclusive and available for all to consume» (Kaul & Mendoza, 2003, 88). In this definition (i) public goods are not just markets failures, (ii) they are not merely state-produced goods, (iii) they are in the public domain because they are technically nonexcludable, because they are placed or left there by policy choice, or because they are allowed to be there inadvertently (Kaul & Mendoza, 2003, 88-89). This expanded definition shows that public goods are not exclusively state-provided; that private goods cannot longer simply be equated with markets and public goods with states because both, market and state, contribute to the provision and production of public and private goods.

The provision of global public goods can suffer many problems because «sometimes a good may be lacking (...) sometimes a good may exist but be shaped in such a way that it entails costs for some people or countries while benefiting others». So, «it is not only the *level* at which goods are provided that may affect people's live; the *way* in which they are provided matters too» (Kaul *et alii*, 2003, 4). According to this, we need to classify properly the global public goods because «some global public goods can only be supplied if every country cooperates; that many need the cooperation of only certain key countries; that most, but not all, require financing; that some can be supplied by mutual restraint or coordination; and that others demands only a single best effort» (Barret, 2007, 2). The first group, the Single Best Effort, means that some global public goods can be provided with the active participation of only one country. The second group, the Weakest Link, means that some global public goods can only be provided with the active participation of every country. In this case, if one country does not help, the entire effort may fail (Barret, 2007, 47). The third group, the Aggregate Efforts, means that some global public goods can only be provided with the aggregate effort of all countries. The provision of these global public goods is mainly done by a certain group of countries (developed countries), there is an irrelevant group of countries (non developed countries) and maybe there is a free riding position for a group of countries (developing countries). The action to address global climate change is a Aggregate Effort case (Barret, 2007, 76).

The last two groups show us that providing global public goods requires international coordination and cooperation but also effective domestic institutions. Sometimes human development is held back because there are not effective domestic institutions. Public goods are under-supply for this reason (Barret, 2007, 11). «A new concept of responsible sovereignty, suggesting that policy sovereignty should include countries' duty to act responsibly toward their citizens (to the inside) and toward the international community (to the outside)» (Kaul *et alii*, 2003, 12).

How to finance global public goods? Since every country will be benefited from the provision of global public goods, which countries will finance? Financing the global public goods, specially those related to climate change, will require an aggregate effort done by the rich countries «on a scale many times greater than the world has ever attempted before» (Barret, 2007, 9). This process will involve the use of policy tools –

financial and non-financial- to facilitate an adequate flow and allocation of public and private resources to get these goods (Kaul *et alii*, 2003, 36). The prevailing method of financing global public goods is to determine an overall budget, and then, somehow, to get countries to pay their share of the total, but the countries that benefits most will not necessarily be the ones that contribute more. «Though the incentives for the great power to supply global public goods are often strong, they can be overridden by other motivations, or tripped up by free riding. The benefits of supplying global public goods can also be overlooked, or misinterpreted, or neglected for reasons of incompetence or ideology» (Barret, 2007, 11).

Perhaps it can be useful to look at some specific proposal for financing some others global public goods, such as drugs. Thomas Pogge propose a «concrete, feasible and politically realistic plan for reforming current national and global rules for incentivizing the search for new essential drugs» (Pogge, 2005, 184) which can be useful for environmental technology's issues because it would distribute the costs more fairly across countries and across generations.

As it has been noticed, bringing new, safe and green technologies is hugely expensive and given such large investment, very little innovative research will be done if there is not trade-related aspects of intellectual property rights (TRIPS) regime that grant companies a temporary monopoly based on the patents of their inventions. This monopoly means that «with competitors barred from copying and selling any newly invented drug during this period, the inventor firm can sell it at the profit-maximizing monopoly price well above, and often very far above, its marginal cost of production» (Pogge, 2005, 186). TRIPS permits to recoup investment and get profits but, as Pogge explains, this regime creates an economical problem because the difference between the marginal cost of production and the sale price impedes «many mutually beneficial transactions between the inventor firm and potential buyers who are unwilling or unable to pay the monopoly price but are willing and able to pay substantially more than the marginal cost of production» (Pogge, 2005, 186). Thomas Pogge explores two strategies, *differential-pricing* and *public good*. The first one has several problems, among them it is the creation of parallel markets (Pogge, 2005, 187). The *public good strategy* is based on three elements: (i) results of successful effort to develop new green technologies are to be provided as public goods that all companies anywhere may use

free of charge; (ii) inventor firms should be entitled to take out a patent on any green technology they invent but, during the life of the patent, should be rewarded, out of public funds, in proportion to the impact of their invention; (iii) develop a fair, feasible, and politically realistic allocation of these costs, as well as compelling arguments in support of this allocation (Pogge, 2005, 188-191).

6. Conclusion

The right to enjoy the benefits of scientific progress is clearly interrelated to the technology transfer commitment included in the 1992 UN Framework Convention on Climate Change and the 1997 Kyoto Protocol. Probable we could say article 27 *Universal Declaration of Human Rights* and article 15.1.b *International Covenant on Economic, Social and Cultural Rights* are the basis for the articles in the Framework Convention on Climate Change and the Kyoto Protocol that deals with the transfer of new technologies, techniques, know-how and scientific information.

The transfer of new technologies, techniques, know-how and scientific information has to be seen as a global public good because our wellbeing and the wellbeing of future generations depends on the provision of some global public goods (i.e. clean or green technologies to prevent or mitigate climate change).

Although there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns, developed and developing countries need new technologies that protect the environment. In this sense, the precautionary principle means that we need to improve and enhance our scientific and technological knowledge. The steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas.

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