"Acts of God" or Human Choices? An Ethical Reflection on "Natural" Disasters

¿"Decretos divinos" o decisiones humanas? Una reflexión ética sobre los desastres "naturales"

Autor

Jorge José Ferrer

Pontificia Universidad Católica de Puerto Rico
E-mail: jorge_ferrer@pucpr.edu

Abstract

The paper argues that, for the most part, disasters are not natural. Although natural hazards normally affect all residents of a geographical area, they are rarely affected to the same degree, given that social vulnerability is unequally distributed in most societies. Social vulnerability is causally related to the distribution of wealth, power, and social status in society, therefore, its distribution is a social justice issue. This paper also analyses the connections between climate change and the increased risk of climate disasters. Pope Francis' "integral ecology" is proposed as a path to the future.

Resumen

El autor sostiene que los desastres, en la mayor parte de los casos, no son naturales. Aunque los eventos naturales de riesgo normalmente afectan a todos los residentes de una región, rara vez afectan a todos de la misma manera. Los grados de vulnerabilidad social se distribuyen de manera desigual en la mayor parte de las sociedades. La vulnerabilidad social es el resultado de la distribución de poder, la riqueza y la posición social. Su distribución desigual plantea un problema de justicia social. El autor también aborda la relación entre el cambio climático y el aumento de los desastres climáticos. La "ecología integral" del papa Francisco se plantea como un camino o puente hacia el futuro.

1. Introduction

Disaster studies is today an academic field on its own right, with academic degree programs and a growing bibliography. Disasters are complex phenomena that require interdisciplinary collaboration. In this paper, I intend to look at disasters through an ethical lens. To say that I will look at disasters as an ethicist requires further clarification.

A great deal has been written about disasters from an ethical perspective. Most of the field's ethical literature focuses, however, on the ethics of managing the disaster, including issues such as rescue, triage, and access to resources, among many others. As important as those issues are, they are not the focus of this paper.

Henk Ten Have has distinguished between the micro- and macroethics of disasters. The distinction between micro- and macroethics is widely used in professional ethics. For the most part, the fields of engineering ethics and bioethics have focused on microethical problems such as informed consent, confidentiality, or issues of scientific misconduct (fabrication, falsification, plagiarism). Macroethics focuses on larger societal issues. Ten Have points out that: "The reference to 'macro' directs our focus onto the social background and conditions of events and cases" (2014, p. 14). In this paper, I intend to examine the social context that contributes to transform a natural hazardous event into a disaster.

> "A disaster is an event (or series of events) that harms or kills a significant number of people or otherwise severely impairs or interrupts their daily lives in civil society" (Naomi Zack, 2009, p. 7)

2. What is a Disaster?

The term "disaster" is sometimes used loosely to refer to a failure or to a poor performance as when we say: "The exam results were a disaster". I am not using the term, of course, in that loose metaphorical meaning. Philosopher Naomi Zack offers the following, more developed definition of the meaning of a disaster:

> A disaster is an event (or series of events) that harms or kills a significant number of people or otherwise severely impairs or interrupts their daily lives in civil society. Disasters may be natural or the result of accidental or deliberate human action… Disasters always occasion surprise and shock; they are unwanted by those affected by them, although not always unpredictable. Disasters also generate narratives and media representations of the heroism, failures, and losses of those who are affected and respond. (2009, p. 7)

Let us set aside for now the distinction between *natural disasters* and *disasters caused by human action*, whether deliberate or accidental. Let us focus on the first statement in Zack's definition: A *significant number of deaths* as well as the *disruption (or dislocation) of survivor's ordinary lives and livelihoods* are essential elements of what we mean by the term "disaster".

Another important component of a disaster is the magnitude of the damage. The losses suffered by the population stricken by a disaster significantly exceed the affected communities' capacity to help themselves (Geale, 2012, p. 447). Outside help is urgently needed. Therefore, disasters challenge the solidarity of the rest of the world. No one disputes the moral duty of solidarity to those in dire need after a disaster. The question is whether there is a moral dimension to disasters that goes beyond the solidarity required by the immediate response. To answer this question, we need to examine the relationship between disasters and social vulnerability, for as the International Federation of Red Cross and Red Crescent Societies states:

> A disaster occurs when a hazard impacts on vulnerable people. The combination of hazards, vulnerability, and inability to reduce the potential negative consequences of risk results in disaster. (International Federation of Red Cross, 2020)

3. Disasters: Natural vs Anthropogenic

If we are going to examine disasters from the viewpoint of ethics, we need to establish whether there is a link between disasters and human causation. Philosopher Tom Regan distinguishes between *moral agents* and *moral patients* (Regan, 1983). Moral agents are beings with the ability to make moral judgments and take responsibility for their actions. As far as we know, only adult, mentally able, human beings qualify as moral agents. We do not apply moral norms or demand moral accountability to non-human animals, rivers, stones, bacteria, or viruses, to give but a few examples. Neither do we attribute moral responsibility to children or to mentally incompetent human individuals. To be morally responsible, a human individual must be capable of performing autonomous actions. In their classical textbook, *Principles of Biomedical Ethics,* Tom L. Beauchamp and James F. Childress adopt what they call a "three-condition theory of autonomy": an action can be considered autonomous if performed intentionally, with enough understanding, and in the absence of controlling influences, whether external or internal (2013, pp. 104-105).

> No one disputes the moral duty of solidarity to those in dire need after a disaster. The question is whether there is a moral dimension to disasters that goes beyond the solidarity required by the immediate response

The intrinsic link between moral accountability and autonomy is entirely compatible with traditional Catholic teaching. It is true that the term "autonomy", as applied to human individual actions in contemporary ethical literature, is not part of the traditional vocabulary of Catholic theology. The tradition has used the language of free will, but both terms can be construed as equivalent as they refer to the issue of moral accountability. Catholic moral theology has traditionally distinguished between *human acts* and *acts of man,* based on the teaching of St. Thomas. Not every act performed by a human being is a human act. Only actions performed with substantial voluntariness and sufficient knowledge count as human acts. Therefore, by definition, acts of nature (or "acts of God" in an older legal formulation) are not susceptible of moral evaluation. Consequently, if a disaster is purely "natural", it is outside the province of ethics.

The naturalness of disasters, however, has been questioned or even totally rejected in much of the professional literature in the field of disaster studies. The habitual distinction between natural and anthropogenic disasters needs to be critically examined. Hazards such as hurricanes, earthquakes, droughts, volcanoes, and pandemics traditionally have been labeled as "natural disasters". On the other hand, consequences of war or an oil spill in the ocean have been labeled as anthropogenic or human-made disasters. Dónal P. O'Manthúana, Bert Gordjin, and Mike Clarke point out, however, that "such classifications can be arbitrary, especially as both natural and human-related factors are involved in most disasters" (2014, p. 4). Ben Wisner, Ilan Kelman, and J. C. Gaillard go even further: They affirm, in no uncertain terms, that there are many causes of disasters "but one clear truth: disasters are not natural" (2014, p. 13). In my opinion, this position is too absolute. It is possible to think of cases in which everyone is equally or nearly equally affected by a natural event, i.e., situations in which the "the natural component dominates" (Wisner, Blaikie, Cannon, & Davis, 1994, p. 9). I think that in those cases it is justified to talk about a "natural disaster". But I agree that, for the most part, disasters are not natural. The hazard, natural or anthropogenic, and the disaster are not identical.

> Factors not immediately associated with social vulnerability often place an individual and his dependents at a disadvantage in a given social context, engendering greater social vulnerability for them

4. Disasters and Social Vulnerability

It is true that hazards such as earthquakes, hurricanes, or droughts affect all the residents of a geographical area. But only rarely are all of them affected equally because the degree of social vulnerability is unequally distributed in most societies.

Wisner, Blaikie, Cannon, and Davis, in their seminal book At Risk, define vulnerability as: "[…] the characteristics of a person or a group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard" (1994, p. 11). They argue that variables such as socio-economic status, gender, age, health status, nationality, ethnicity, and religious or political beliefs and affiliations, among other characteristics, determine to a large extent the degree of social vulnerability of an individual or household (1994, pp. 15-16). It is important to underline that factors not immediately associated with social vulnerability, such as religious or political affiliation, often place an individual and his dependents at a disadvantage in a given social context, engendering greater social vulnerability for them.

Social vulnerability is not natural. It is causally related to the distribution of wealth, power, and social status in society. I will use the term "social status" to include the diverse characteristics that contribute to social vulnerability. Social status is not natural because it is not handed down from heaven, as if by divine decree, or established by an irreversible law of nature. This is not to deny that some natural factors have an influence on the social status of a person. For example, severe intellectual or physical handicaps place a person at a disadvantage, increasing their likelihood of suffering a greater degree

of social vulnerability. But, for the most part, social status and social vulnerability are related to what Rawls has called the *basic structure of society*.

5. The Basic Structure of Society and the Principle of Justice

In his celebrated *Theory of Justice,* Rawls defines the basic structure of society as "the way in which the major social institutions distribute fundamental rights and duties to determine the division of advantages from social cooperation" (1999, p. 6). The basic structure of society is not the result of unfathomable divine decrees, nor of the blind forces of nature. It has evolved as the result of multiple human choices, normally produced, implemented, and developed across generations. The fact that the present structure of any given society is not the result of the decisions and actions of any single identifiable individual, does not mean that it is outside the province of moral evaluation, since we have the possibility of influencing its reform.

> Justice does not require absolute equality in every aspect of life, but it does require a fair distribution of benefits and burdens among citizens

Indeed, the basic structure of society is the fundamental subject of justice, according to John Rawls:

> The basic structure of society is the primary subject of justice because its effects are so profound and present from the start. The intuitive notion here is that this structure contains various social positions and that men born into different positions have different expectations of life determined, in part, by the political system as well as by economic and social circumstances. In this way the institutions of society favor certain starting places over others. These are especially deep inequalities. Not only are they pervasive, but they affect men's initial chances in life; yet they cannot possibly be justified by an appeal to the notions of merit and desert. It is these inequalities… to which the principles of justice must in first instance apply… The justice of a social scheme depends essentially on how fundamental rights and duties are assigned and on the economic opportunities and social conditions in the various sectors of society. (1999, p. 7)

Justice does not require absolute equality in every aspect of life, but it does require a fair distribution of benefits and burdens among citizens. It is true that "justice" may mean different things to different people. Robert Nozick's understanding of justice, for example, differs significantly from Rawls.

My reflection on justice is grounded in the Catholic Social Tradition. Even in the Catholic tradition, justice has been understood as an analogous concept. We have traditionally distinguished between commutative, legal, and distributive justice. The term "social justice" is more recent. It entered the social magisterium of the Church with Pius XI. Fundamentally, social justice emphasizes the fair distribution of opportunities in society, particularly to the most vulnerable. Thomas Massaro explains it in the following terms:

The phrase social justice conjures a wide range of images and associations… But… all common notions of social justice boil down to the goal of achieving a right ordering of society. A just social order is one that ensures that all people have fair and equitable opportunities to live decent lives free of inordinate burdens or deprivations. (2016, p. 2)

> Social justice emphasizes the fair distribution of opportunities in society, particularly to the most vulnerable

A just society is, then, one that guarantees to every person the opportunities and the fundamental means to lead a life according to the requirements of human dignity. It is my conviction that the basic requirements of justice can be rendered today in the language of human rights. A just society guarantees to all its members the protection of their fundamental human rights, both of first and second generations. The differential distribution of social vulnerability, therefore, is rightly conceived as a question of social justice. The intimate relationship between the unequal distribution of social goods, social vulnerability, and disasters has become clear to me as I have reflected on people's experiences after hurricane Maria (2017) in my native Puerto Rico.

6. Social Vulnerability and Social Justice: The Case of Hurricane Maria

Vulnerability means that some persons and groups of persons "are more prone to damage, loss and suffering in the context of differing hazards" (Wisner, Blaikie, Cannon & Davis, 1994, p. 11). Insofar as such susceptibility is the result of the social distribution of wealth and power, we are facing an issue of social justice. In Puerto Rico, we all experienced the hurricane — all those who did not fly out of the Island before the atmospheric phenomenon crossed our shores. The fact that some people had the possibility of fleeing the threat of a hazard points out the diversity of possibilities that different people have available. Some individuals and families had the resources (such as money, contacts, properties) that allowed them to move to a different geographic location, escaping the hazard altogether. Others did not leave, either by choice or because they did not have the capacity to do so. Those who stayed or were forced to stay withstood the hurricane winds. The next day, and for the following weeks, most of us did not have electric power, access to the Internet, phone (neither cell phones nor landlines, only mobile satellite phones were operative in the aftermath of the hurricane), or TV. Most radio stations were damaged and could not broadcast. Gasoline was extremely scarce.

We all suffered, then, all or many of these limitations. But that does not mean that everyone in Puerto Rico was affected to the same degree. Houses built according to established hurricane codes withstood Maria's onslaught. Upper middle-class and upper-class households had, for the most part, diesel or gasoline powered generators and water cisterns that made the situation bearable. This does not mean that the livelihoods of middle-class and even some upper-class people were not affected. Businesses and professional offices were unable to open for weeks or even months. But they had greater resilience, thanks to resources such as well-built houses, savings, and insurance.

On the other hand, according to press reports, approximately 300,000 residences were damaged by the hurricane. FEMA[1] distributed approximately 126,000 of its blue tarps in Maria's aftermath. At the beginning of the 2018, almost a year later, hurricane season, thousands were still living under one of those provisional roofs. More than 1,700 families were displaced and living in motels until FEMA discontinued the Program in June of 2018, leaving many individual and families literally homeless.

Even though the hazard impacted everyone, the disarticulation of lives and livelihoods was unequally distributed. Why? Social vulnerability was already unequally distributed before the hurricane. Puerto Rico is a very unequal society, because of many decades of mismanagement, corruption, and colonialism. If we take Puerto Rico as a country on its own, separate from the United States[2], it has one of the highest levels of inequality in the whole world. In 2018, the University of Puerto Rico Cayey Campus' Census Information Center (Centro de Información Censal) published an update on social inequality in Puerto Rico, based on the World Bank's 2017 report on Gini coefficients worldwide. South Africa was at the top of the list with a GINI coefficient of 63. Zambia occupies the second place (57.1) and Puerto Rico ranks third with a Gini coefficient of 54 (Centro de Información Censal, 2018). The recession that Puerto Rico has experienced since 2006, has affected the poorer segments of the population much more than the other segments. Unsurprisingly, the inequality has continued to grow as the economy contracts. The present COVID-19 pandemic has come to increase social inequality in Puerto Rico.

> It is true that socio-economic poverty is not the only factor that generates social vulnerability. It has been said before, but it is useful to repeat it

It is true that socio-economic poverty is not the only factor that generates social vulnerability. It has been said before, but it is useful to repeat it. Gender, race, immigration status, even when not directly associated to socio-economic poverty, are sources of inequality and discrimination. But, once that is asserted, let us focus on socio-economic poverty. The poorer segments of the population live in unsafe places, in houses poorly built. They lack insurance protections, and often do not have legal ownership of their homes. Moreover, poverty is normally associated with poor education and lack of access to information.

I think that the case of Puerto Rico after Maria illustrates what is meant when we say that social vulnerability and inequity are determining factors in susceptibility to disaster. This situation of vulnerability is, as I have already stated, not natural. It is the result of the way society has been structured throughout the years. No single individual bears sole responsibility for the situation, but we all bear some responsibility. A society with such marked differences is not a well-ordered society, to use Rawlsian terminology, because

---

1   FEMA stands for Federal Emergency Management Agency. It is an agency of the US Federal Government. It is responsible for the coordination of disaster response in the US when the resources of the local government are insufficient to respond adequately to the situation.

2   Puerto Rico is an unincorporated US territory under the territorial clause of the Constitution of the United States. The Island was a Spanish possession until 1898 when the US invaded during the Spanish American War (or *Guerra de Cuba* in Spain). Puerto Ricans became US citizens in 1917. Many in the US do not know that Puerto Ricans are US citizens.

not everyone has access to the basic opportunities and protections required for the satisfaction of basic human needs, such as nutrition, adequate shelter, quality health care, and fair access to quality educational opportunities, for themselves and their families.

> The case of Puerto Rico is also instructive because in addition to the presence of highly vulnerable individuals and households, the whole of Puerto Rico was, at that point in its history, in a situation of collective social vulnerability

Justice does not require that we abolish all inequalities, but we cannot allow inequalities that conflict with fundamental human rights, such as decent housing and access to adequate health care and education services. Social vulnerability threatens fundamental human rights, including the right to life. What happened in Puerto Rico in the aftermath of Maria shows it very clearly. Maria's death toll was remarkably high. The School of Public Health of George Washington University, working in collaboration with the School of Public Health of the University of Puerto Rico, estimated the excess post-hurricane mortality in 2,975 persons. The impact differed by age and socioeconomic status:

The results of our analysis of total excess mortality by socio-demographic subgroups show that every social stratum and age group was affected by excess mortality. However, the impact differed by age and socioeconomic status. The risk of death was 45% higher and persistent until the end of the study period for populations living in low socioeconomic development municipalities, and older males (65+) experienced continuous elevated risk of death through February. (Milken Institute, 2018, iii)

The case of Puerto Rico is also instructive because in addition to the presence of highly vulnerable individuals and households, the whole of Puerto Rico was, at that point in its history, in a situation of collective social vulnerability. The infrastructure was in a poor condition before the hurricane. The Government of Puerto Rico was (and is to this day) literally bankrupt with a 70-billion-dollar debt and operating under the control of an oversight board appointed by the US federal government.

What can we do to avoid or reduce disasters, in Puerto Rico and everywhere else? I use Puerto Rico as an illustration of a wider problem. The most important risk reduction measure, in my view, is the reduction of social vulnerability, or, in other words, the promotion of social justice. It is a moral responsibility that we all share. Indeed, I would suggest that we cease to talk about natural disasters. There are natural hazards, but disasters are, for the most part, the result of a basic social structure which does not respond to the principle of social justice. Natural hazards plus social vulnerability produces a disaster.

7. Haiti, Chile, and Global Inequalities: Disasters and Global Social Justice

Two major earthquakes scourged the Latin American and Caribbean Region in 2010. On January 12, Haiti suffered the impact of a magnitude 7.0 earthquake. The results were of catastrophic proportions for that country, the poorest in the western hemisphere. A month later, on February 27, a more severe earthquake, magnitude 8.8, struck Chile.

Although the power of the natural event was greater in Chile, the results although lamentable, were not catastrophic for that country. Writing in Nature shortly after the events, Richard Lovett asserted that: "[…] the destruction was worse in Haiti, where an estimated 230,000 people were killed. In Chile, the death toll reported on 28th February was 708…" (2010). The final death count in Haiti was considerably higher: 316,000 people (Ten Have, 2014, pp. 18-19).

> Do we have duties of justice towards people who live in distant lands, citizens of a different nation, members perhaps of a different ethnic group, or religious tradition?

This comparison shows that there are great differences in the level of vulnerability between countries and regions. The differential vulnerability among countries would intuitively seem to be a moral issue, particularly for one who considers the issue from the viewpoint of the Catholic social tradition. As already suggested, most people would agree that we have certain moral duties towards the victims of disasters. The question is whether they are duties of justice. Do we have duties of justice towards people who live in distant lands, citizens of a different nation, members perhaps of a different ethnic group, or religious tradition? In other words: are there duties of social justice on a global scale? Since I have addressed this issue elsewhere, I will touch upon it very briefly here (Ferrer, 2011, 2013). I argue that it is possible to talk about duties of global justice based on the existence of a global basic social structure, on the doctrine of universal human rights and, at least in some cases, on previous exchanges that have contributed to situations of vulnerability in certain parts of the world.

7.1. The argument based on a global "basic social structure"

Traditionally the theory of justice, particularly of distributive justice, has been intrinsically linked to political theory. We can already see this link in the most influential work of political theory in the western tradition: Plato's *Republic*. From Plato to Rawls, the theory of justice has been "political", linked to the theory of the State. The most radical understanding of the inseparability between the State and justice is to be found in the work of Thomas Hobbes (1588-1679). Thomas Nagel grounds his rejection of global socioeconomic justice on Hobbes' political philosophy. For Hobbes, justice is not possible if there is no government. Therefore, "global justice without a world governance is a chimera" (Nagel, 2005, p. 115). He summarizes Hobbes argument as follows:

> Hobbes construed the principles of justice, and more broadly the moral law, as a set of rules and practices that would serve everyone's interest if everyone conformed to them. This collective self-interest cannot be realized by the independent motivation of self-interested individuals unless each of them has the assurance that others will conform if he does. That assurance requires the external incentive provided by the sovereign… (Nagel, 2005, p. 115)

As a man of the 21st century, Nagel does not subscribe to Hobbes' political absolutism. He also admits that there are some minimal humanitarian duties "we owe fellow human

beings threatened with starvation or severe malnutrition and early death from easily preventable diseases (Nagel, 2005, p. 118)". But, he argues, humanitarian assistance is not justice: "Justice as ordinarily understood requires more than mere humanitarian assistance" (Nagel, 2005, p. 118). In summary, any talk about duties of justice on a global scale is, in his view, philosophical nonsense.

> If Nagel is right, we cannot claim that there is a duty of justice to reduce the social vulnerability that preceded and made the disaster possible

If Nagel is right, there is a moral duty to provide emergency assistance to the victims of a disaster, such as the Haitian earthquake. We cannot claim, however, that there is a duty of justice to reduce the social vulnerability that preceded and made the disaster possible. If we accept the intrinsic and indissoluble unity between justice and political sovereignty, Nagel's conclusion would seem to be inescapable. We must ask, however, whether his argument adequately reflects the realities of a globalized world.

Let us go back to Rawls' idea of the basic structure of society. As already stated, the concept refers to those basic political and socioeconomic structures that condition and even determine people's possibilities to develop and pursue life plans even before they are born. In my opinion, Allen Buchanan's criticism of Rawls' *Law of Peoples,* a work on international relations, can be substantially applied to Nagel's argument against global justice. According to Buchanan, Rawls fails "to appreciate that there is a global basic structure." He goes own to argue that Rawls' *Law of Peoples* is written to address the realities of "a vanished Westphalian world and hence of little value for our world" (Buchanan, 2000, p. 701):

> By a Westphalian world, I mean the world represented in the international legal system that grew out of the Peace of Westphalia in 1648. There are two fundamental features of a Westphalian world. States are conceived of (1) as more or less economically self-sufficient units… (2) as politically homogenous, unified actors, without internal political differentiation. (Buchanan, 2000, p. 701)

These fundamental features do not correspond to the realities of the globalized economy of the 21st century. In a globalized economy we are connected to each other across the globe in a very real way: a financial crisis in any corner of the world affects the economy, as well as political decisions, everywhere on the face of the earth. Moreover, decisions made by the board of directors of powerful global corporations directly affect the lives of many individuals and households, as well as political decisions everywhere but even more in less developed countries. In my opinion, Buchanan's claim of the existence of a global basic structure is hard to deny:

> There is a global basic structure. Its existence and major features are documented in a vast and growing interdisciplinary literature that goes under various headings: globalization, structural dependency, and theory of underdevelopment… The chief point is that, like a domestic global structure, the global basic structure in part determines the prospects not only of individuals but of groups, including peoples… (Buchanan, 2000, pp. 705-706)

If Buchanan is correct in his analysis, and I think that he is, Nagel's argument is severely undermined. In the era of globalization, we are all part of a single economic and political (or cosmopolitan) reality, insofar as economic interests in a borderless free trade world have a decisive influence on political arrangements and in the daily life of individuals and communities everywhere.

7.2. The argument based on universal human rights

Moreover, both Nagel and Rawls admit that human rights have transnational validity. These authors, however, according to classical liberal (and neoliberal) orthodoxy, tend to deny such normative force to socio-economic and cultural rights, the so-called second generation of human rights. As theologian Lisa Cahill argues, the disagreement "is not so much… about what is good for human flourishing, but about who exactly is entitled to flourish" (Cahill, 2002, p. 337). Human rights protect those basic human needs and goods which are fundamental for human flourishing, such as nutrition, shelter, freedom of conscience, access to information and education, among others.

> The first and second generation of human rights are like a seamless garment. It is impossible to adequately protect civil and political rights without socio-economic and cultural rights

Normally, liberal, and neoliberal thinkers accept the universal validity of civil and political rights but not of the socio-economic and cultural rights (second generation). In my opinion, the first and second generation of human rights are like a seamless garment. It is impossible to adequately protect civil and political rights without socio-economic and cultural rights. The right to political participation, for example, is effectively and severely restricted without access to education, information, adequate nutrition, and health care.

If we accept that there are universal human rights, we are bound to accept that there are universal justice claims, since justice consists precisely in giving to everyone her rights. Ultimately, human rights are based on the fact that we share a common humanity, endowed with an equal human dignity, wherever we may happen to be born and live, whatever might be the color of our skin, and however we may choose to worship or not to worship at all.

If we share one common humanity, are bound by one global economic system, and are protected by equal human rights, the reduction of social vulnerability is a duty of social justice.

7.3. The argument based on previous exchanges that have generated vulnerability

We cannot forget that historically the wealth of some nations has been built, at least in part, on the exploitation of other nations. Let us remember European imperialism in Africa in the 19th and early 20th centuries or US interventions in Latin America to establish or support political regimes favorable to US economic interests. I cannot develop this

argument here, but I think that it must be at least mentioned since much misery in the world is at least partially related to colonialism and other forms of political domination and economic exploitation.

Based on the three arguments, I propose that the reduction of vulnerability to disasters requires social justice both internally in every nation and globally in the society of nations. Social vulnerability is an ethical issue precisely because it is not natural. It is, for the most part, the result of a global system in which access to the basic goods necessary for human flourishing are systematically and structurally denied to most of humanity. The centrality of justice does not mean that duties based on other principles, such as beneficence and charity, may also be binding upon us as we respond to disasters.

8. Climate Change and the Ethics of Disasters

> According to the Pope, the protection of the environment and social justice are not antithetical. Quite the opposite: they go hand in hand

The debate about climate change cannot be ignored as we question the naturalness of disasters. The basic argument can be stated straightforwardly. If 1) climate change has an impact on the frequency and severity of climatic disasters, as well as their effects on vulnerable populations, and 2) if climate change is, at least to a large extent, anthropogenic, then 3) we are facing another moral challenge related to the macroethics of disasters. I will touch on this issue briefly, since it may well be the topic for another paper. I will end this session with an appeal to what Pope Francis has called an "integral ecology". According to the Pope, the protection of the environment and social justice are not antithetical. Quite the opposite: they go hand in hand.

8.1. Climate change is real, and it is anthropogenic

Although there are some climate change deniers (or skeptics, as they prefer to be called), the vast majority of climate scientists agree that the global temperature is rising. They also agree that the fundamental cause of global warming is connected to human activity. Although global warming and climate change are not identical, they are intimately connected. Climate change is a broader concept than global warming. The latter term refers to the rising of global temperatures, while the former includes other deleterious changes taking place because of greenhouse gases (GHG) pollution in our planet. In this paper, I use both terms as practically equivalent since climate change is largely caused by global warming. The following citation, taken from the U.S. Global Change Research Program 2017 Climate Science Special Report, gives us a good summary statement of the situation:

> Global annually averaged surface air temperature has increased by about 1.8 °F (1.0 °C) over the last 115 years (1901-2016). This period is now the warmest in the history of modern civilization. The last few years have also seen record-breaking, climate-related

weather extremes, and the last three years have been the warmest years on record for the globe. These trends are expected to continue over climate timescales. This assessment concludes, based on extensive evidence, that it is extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century. For the warming over the last century, there is no convincing alternative explanation supported by the extent of the observational evidence. (US Global Change Research Program, 2017, p. 10)

> We should not forget, however, that developed countries, like the United States, will also suffer the consequences of climate change

These data have been confirmed, as the cited report states, by thousands of studies. On October 6, 2018, the Intergovernmental Panel on Climate Change (IPCC) published a special report on the impacts of global warming of 1.5 °C above pre-industrial levels. According to that document, dire consequences are to be expected from the increase in global temperature. Among the adverse consequences listed by the report are increased heat related morbidity and mortality, and reduction in agricultural yields of cereal crops such as maize, wheat, and rice. It should not be overlooked that those cereals play a crucial role in the nutrition of vast populations, particularly among the poor. Unsurprisingly poor communities will suffer more from climate change than their more affluent counterparts.

We should not forget, however, that developed countries, like the United States, will also suffer the consequences of climate change. Let us take the rise of sea level as an example. The sea level rise threatens many small island states with partial or total flooding and total disappearance, creating a new class of climate refugees. But it also threatens the security and well-being of many residents of the United States, particularly those living in densely populated coastal areas such as Florida or New York.

8.2. The Skeptic's Challenge

Before we move to the articulation of some ethical reflections on the relationship between disaster vulnerability and climate change, a potential difficulty needs to be faced, even if we can only do it briefly. Whenever we talk about climate change, despite the overwhelming scientific consensus on the topic, we will find someone who advances the skeptic's challenge: how do we know that all these changes are mainly anthropogenic and not part of natural climate variability? There were changes in the climate of our planet long before human beings were around burning fossil fuels. To answer this difficulty, I will follow the arguments presented by Jeffrey Bennet in his book A Global Warming Primer (2016), a book written for non-scientists. We need to ask whether the source of global warming may be found in variations in the Sun's energy output or other natural causes, independent from human agency. If human agency can be excluded, even if climate change is real, it is not a moral issue[3].

---

3   An ethical caveat is in order at this point. Even if climate change would turn out to be the result of natural causes, that would not absolve us of all moral responsibility. We still would have duties of mitigation and of assistance to those most affected by climate change.

As a matter of fact, the Sun's energy output does vary from one year to the next. However, this variation is small, less than 1%. Nonetheless those small changes have probably been the cause of changes in the past, such as past ice cycles. In recent decades, however, "the amount of sunlight has moved in the opposite direction of the observed warming, which means the Sun cannot be the cause of observed warming" (Bennet, 2016, p. 33). Moreover:

> If the Sun were responsible for global warming, we would expect the extra sunlight reaching Earth to warm the surface and the entire atmosphere more or less uniformly. In contrast, while the greenhouse effect warms Earth's surface and lower atmosphere, it actually cools Earth's upper atmosphere… just as expected with a strengthening greenhouse effect, and the opposite of what we'd expect if global warming were being caused by the Sun. (Bennet, 2016, p. 34)

> How do we know that all these changes are mainly anthropogenic and not part of natural climate variability?

If variations in the Sun's energy output cannot be the explanation, could other natural factors be the source of global warming? It is true there are many factors, natural and otherwise, that are partially responsible for global warming. Scientists study these possibilities using complex computer models, which can accurately reproduce the climate of the past century. The results of these studies lead us to conclude that:

> There are no known factors that could account for the substantial warming of the past century… Scientists investigate other potential causes with models, and today's models match up extremely well with observations of the actual climate but only when we include the human contributions to global warming, not natural factors alone. The match makes it highly likely that the models are on the right track, giving us further confidence in the idea that human activity is the cause of most recent global warming. (Bennet, 2016, p. 37)

We can, then, have moral certainty of the anthropogenic origin of global warming and climate change. It would be imprudent, in the strictest ethical sense of the term, to deny it and to refuse to modify our conduct accordingly. Of course, this is not easy and there can be reasonable disagreements about concrete strategies to deal with this moral challenge. In my view, this is clearly a case in which the invocation of the precautionary principle is in order. Marion Hourdequin gives a useful summary of the ethical meaning of the precautionary principles:

> The precautionary principle… places special weight on the protection of human health and the environment. Under this approach, human health and the environment are prioritized. The precautionary principle suggests that we take measures to protect human and environmental health when our actions place

them at risk, even of the precise nature and magnitude of the risks are unknown. (Hourdequin, 2015, pp. 38-39)

The absence of full scientific certainty of a threat is not a valid reason for avoiding or postponing the implementation of adequate protective measures. The principle fully applies in the case of global warming and climate change. The high probability of severe harm to future generations as well as to the more vulnerable populations in the present requires that we take immediate action here and now.

> The scientific evidence suggests that anthropogenic climate change is the cause of climatic disasters affecting vulnerable populations in the present and, even more so, in the future

The scientific evidence suggests that anthropogenic climate change is the cause of climatic disasters affecting vulnerable populations in the present and, even more so, in the future. It is, therefore, impossible to articulate an ethical discourse about the macroethics of disasters while ignoring the problems generated by global warming and climate change.

Since socially vulnerable populations will be most affected by climatic disasters, it seems obvious to conclude that the ethics of global warming and climate change brings us back to the principle of social justice, both on the national and the global scales. As already suggested, Pope Francis' idea of "integral ecology" clearly states the intrinsic connection that exists between ecological responsibility and our commitment to the promotion of justice. We read in *Laudato si'* 48 and 49:

> The human environment and the natural environment deteriorate together; we cannot adequately combat environmental degradation unless we attend to causes related to human and social degradation. In fact, the deterioration of the environment and of society affects the most vulnerable people on the planet: "Both everyday experience and scientific research show that the gravest effects of all attacks on the environment are suffered by the poorest"[4][…]. Today, however, we must realize that a true ecological approach always becomes a social approach; it must integrate questions of justice in debates on the environment, to hear both the cry of the earth and the cry of the poor.

In the number 139 of the Encyclical appears the same idea:

> We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental. Strategies for a solution demand an integrated approach to combating poverty, restoring dignity to the excluded, and at the same time protecting nature.

---

4   The reference citation within our citation of the encyclical is: Bolivian Bishops' Conference, Pastoral Letter on the Environment and Human Development in Bolivia *El universo, don de Dios para la vida* (March 23, 2012), 17.

Besides social justice, an integral ecology requires respect and reverence for creation, based on the recognition of the intrinsic value of all living beings. It might seem that we have wandered a bit far away from the topic of natural disasters. We have not. Disasters, as anthropogenic, are largely based on a culture that forgets that we are all brothers and sisters, and that we are here to take care of each other and to take care of all lifekind. As we read in the Yahwist account of creation: "The Lord God… took the man and settled him in the Garden of Eden, to cultivate and care for it" (Genesis 2:15). Climate change will increase the intensity and frequency of climatic hazards. Those hazards will severely affect vulnerable populations. Therefore, the macroethics of disasters, based on the principle of global social justice, requires that we commit our efforts to both mitigate human vulnerability and fight against climate change.

9. Conclusion

Disasters occur when hazards impact a vulnerable population. For the most part, the traditional distinction between natural and anthropogenic disasters is not useful. It tends to mask the fact that the natural hazard is not the same as the disaster. It is true that earthquakes, hurricanes, and other natural hazards normally affect all the residents of a country or region, but they are not affected in the same degree. Social vulnerability is unequally distributed. Variables such as socio-economic status, gender, age, and ethnicity (among others) largely determine the degree of vulnerability of persons and households.

> It is true that earthquakes, hurricanes, and other natural hazards normally affect all the residents of a country or region, but they are not affected in the same degree

Social vulnerability is not natural. It is largely determined by the distribution of power and wealth in society. Since human decisions and human accountability are, thus, decisive for the occurrence of a disaster, we have concluded that disasters, for the most part, are neither natural nor so-called "acts of God". They are very much rooted in human attitudes and decisions, that have been enshrined in social structures, both at the national and global levels.

Since climate change is a factor that threatens to increase the frequency and intensity of hazardous climatic events, an integral ecology, as proposed by Pope Francis, is presented as the ethical path to follow as a bridge to a more just and fraternal future for humanity and for the planet. The central ethical principle of an integral ecology is, in my view, the principle of social justice, both political and global, including the interests of future human generations and the stewardship of all creation.

References

Beauchamp, T. L., & Childress J. F. (2013). *Principles of Biomedical Ethics* (7th ed.). New York: Oxford University Press.

Bennet, J. (2016). *A Global Warming Primer*. Boulder: Big Kid Science.

Buchanan, A. (2000). Rawls's Law of Peoples: Rules for a Vanished Westphalian World. *Ethics, 110*(4), 697-721. DOI: https://doi.org/10.1086/233370

Cahill, L. S. (2002). Toward a Global Ethic. *Theological Studies*, *63*(2), 324-344. DOI: https://doi.org/10.1177%2F004056390206300205

Centro de Información Censal, Universidad de Puerto Rico en Cayey (2018). Desigualdad social en Puerto Rico y en el mundo. En Notas del Centro de Información Censal Número 29. Retrieved from http://www.upr.edu/iii-cayey/mdocs-posts/notas-del-centro-de-informacion-censal-cic-29-desigualdad-social-en-puerto-rico-vs-el-mundo/

Francis. (2015). Encyclical Letter *Laudato si'*. Retrieved from http://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

Ferrer, J. J. (2011). *¿Hay deberes de justicia en el nivel global? Justicia global, derechos humanos y la tesis de la túnica inconsútil*. En F. J. León Correa (ed.), *Bioética y sociedad en América Latina* (pp. 20-28). Santiago de Chile: FELAIBE.

Ferrer, J. J. (2013). El VIH/SIDA: ¿Un problema de justicia global? En F. J. de la Torre (ed.), *30 años de VIH-SIDA. Balance y nuevas perspectivas* (pp. 33-50). Madrid: Universidad Pontificia Comillas.

Geale, S. (2012). The Ethics of Disaster Management. *Disaster Prevention and Management, 21*(4), 445-462. DOI: https://doi.org/10.1108/09653561211256152

Intergovernmental Panel on Climate Change (2018). *Global Warming of 1.5 °C. Executive Summary*. Retrieved from https://www.ipcc.ch/sr15/

International Federation of the Red Cross (2020). *What is a Disaster?* Retrieved from https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/

Klein, N. (2014). *This Changes Everything. Capitalism vs the Climate*. New York: Simon & Schuster.

Levitt, R. A. (2010). *Why Chile Fared Better than Haiti?* [Versión digital]. Retrieved from https://www.nature.com/news/2010/100301/full/news.2010.100.html

Hourdequin, M. (2015). *Environmental Ethics*. London: Bloomsbury.

Massaro, T. (2016). *Living Justice* (3rd ed.). Lanham: Rowman & Littlefield.

Milken Institute School of Public Health, George Washington University (2018). Ascertainment of the Estimated Excess Mortality from Hurricane Maria in Puerto Rico. Retrieved from https://publichealth.gwu.edu/sites/default/files/downloads/projects/PRstudy/Acertainment%20of%20the%20Estimated%20Excess%20Mortality%20from%20Hurricane%20Maria%20in%20Puerto%20Rico.pdf

Nagel, T. (2005). The Problem of Global Justice. *Philosophy and Public Affairs, 33*(2), 113-147. DOI: https://doi.org/10.1111/j.1088-4963.2005.00027.x

Nozick, R. (1974). *Anarchy, State and Utopia*. New York: Basic Books.

O'Mathúna, D. P., Gordijn, B., & Clarke M. (2014). Disaster Bioethics: An Introduction. En D. P. O'Mathúna, B. Gordijn, & M. Clarke (eds.), *Disasters Bioethics: Normative Issues When Nothing is Normal* (pp. 3-12). Dordrecht: Springer. DOI: https://doi.org/10.1007/978-94-007-3864-5_1

Rawls, J. (1999). *A Theory of Justice*. Cambridge: Harvard University Press.

Regan, T. (1983). *The Case for Animal Rights*. Los Angeles: University of California Press.

Ten Have, H. (2014). Macro-Triage in Disaster Planning. En D. P. O'Mathúna, B. Gordijn, & M. Clarke (eds.), *Disasters Bioethics: Normative Issues When Nothing is Normal* (pp. 13-32). Dordrecht: Springer. DOI: https://doi.org/10.1007/978-94-007-3864-5_2

US Global Change Research Program (2017). *Climate Science Special Report 2017*. Retrieved from https://science2017.globalchange.gov/

IPCC. (2018., October 6). Global Warming of 1.5 °C,. Retrieved from http://www.ipcc.ch/report/sr15/

Wisner, B., Blaikie, P., Cannon, T., & Davis I. (1994). *At Risk. Natural Hazards, People's Vulnerabilities and Disasters*. London: Routledge. DOI: https://doi.org/10.4324/9780203714775

Wisner, B., Kelman, I., & Gaillard, J. C. (2014). Hazard, vulnerability, Capacity, Risk and Participation. In A. López-Carresi, M. Fordham, B. Wisner, I. Kelman, y J. C. Gaillard (eds.), *Disaster Management. International Lessons in Risk Reduction, Response and Recovery* (pp. 13-22). London and New York: Routledge.

Zack, N. (2009). *Ethics for Disaster*. Lanham: Rowman & Littlefield Publishers.