



THE WAILING OF GOD'S CREATURES

CATHOLIC SOCIAL TEACHING, HUMAN ACTIVITY
AND THE COLLAPSE OF BIOLOGICAL DIVERSITY

*A Report by Laudato Si' Research Institute for CIDSE,
CAFOD and GCCM on the Current Biodiversity Crisis*

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EXECUTIVE SUMMARY

1. The crisis of biological diversity loss demands immediate attention from all, including, and perhaps especially, the Roman Catholic Church.

The anthropogenic decline of biodiversity has reached such a dramatic level that biologists consider it the beginning of a sixth mass extinction, in the course of which the planet could lose the majority of its wildlife, making it impossible for the system to adapt any further. Already, the ecological and social implications of this catastrophe are being felt, primarily by the most vulnerable communities in low- and mid-income countries. The situation demands immediate action by all – scientists, policy makers, and also the Roman Catholic Church. This report seeks to offer Catholic actors some necessary insights into the socio-ecological crisis of biodiversity loss and recommend how to advocate for the protection of the biosphere in light of Catholic Social Teaching (CST).

2. Biodiversity is essential to ensure planetary health and the survival of all organisms, including humans.

Biodiversity, the variety of life in all its many manifestations (genetic, organismal, ecological), is an evolved complex web of interdependent elements, where a permanent loss at any level will result in substantial adverse degradation at all other levels. Such losses are always associated with a decline of ecosystem health and, in turn, of ecosystem services, the benefits provided by a functional ecosystem to all its members. Aside from food and shelter, humans depend on ecosystems to provide them with, among other necessities, energy, climate regulation, purification of air and water, flood protection, medicine, as well as cultural, recreational, aesthetic, and spiritual services. When ecosystem health is compromised due to the extensive loss of biodiversity, all life, including human life, is at risk of losing the foundation of survival.

3. Biodiversity is under serious threat due to human activities.

Since 1970, 68% of vertebrate wildlife has been lost, with Latin America/Caribbean and Africa, two regions with many economically underdeveloped nations, bearing the brunt of the losses. This tendency is also reflected in the data available on invertebrates and plants. Extinction is primarily driven by land use change, overexploitation, invasive species, environmental pollution, and climate change. One of the regions most affected by the destruction of biodiversity is the Amazon rainforest, where around one million square kilometres have been destroyed since the 1970s through illegal logging, expanding agriculture and cattle farming. The loss of forest also endangers local indigenous, traditional, and rural people. Unlike other regions of the world, the Amazon rainforest is in greater danger of not recovering from the massive loss of biodiversity.

4. Inequitable/unequal consumption is a key driver of biodiversity decline.

There are 7.84 billion people in the world today. Their combined demands on the Earth's systems are great and unequal. Consumption is unbalanced, with the wealthiest 20% using up 80% of global resources. It is not simply the number of people on earth per se that is important, it is the unsustainable lifestyles of the wealthiest combined with their disproportionate power in influencing policies and practices that exploit the natural world and put biodiversity at risk. Humanity's ecological footprint exceeds Earth's biocapacity by over 50%, so that we would need 1.6 Earths to sustain our unsustainable lifestyle. High population growth rates in underdeveloped countries are a function of global social inequality and could be curbed by increasing education, especially for girls and women, more so than by contraception. Education would have to be oriented toward developing sustainable attitudes and habits to avoid consumption rates rising even further when growth rates normalise.

5. Efforts to respond to the biodiversity crisis have been inadequate and unimplemented.

The past decades have seen an intensification of national and international efforts to address the issue of biodiversity loss and to protect the biosphere. The United Nations Convention on Biological Diversity (CBD) is a multilateral treaty that has been signed by almost all states. At the 2010 CBD Conference of Parties (COP) the Aichi Targets were adopted as part of the CBD Strategic Plan for Biodiversity. Not one of the targets were met by 2020, their intended endpoint, which has made it necessary to develop a Post-2020 Global Biodiversity Framework. Its adoption at COP 15 in Kunming, China, later this year is seen by many as the most important biodiversity policy in a decade. Other important efforts are the UN Agenda 2030 with its 17 Sustainable Development Goals (SDGs), of which most are of direct or indirect relevance for biodiversity.

6. Catholic Social Teaching offers a unique integral perspective on how to respond to the biodiversity crisis.

From the perspective of CST, human flourishing is intricately linked to the well-being of other creatures, for it is the relationship with the natural world that constitutes the human being, and in which their relationship with God comes to the fore. Hence, Pope Francis insists in *Laudato Si'* (§217) that safeguarding “God’s handiwork” is a vocation that is essential to a life of virtue. Participating actively or inactively in the destruction of biodiversity, then, is an ecological sin. According to CST all creatures have intrinsic value, no matter what benefit they may offer humanity. For Pope Francis, the root cause of the crisis lies in the globalisation of the technocratic paradigm that views biological diversity as “capital assets” that can be used at will and, at best, require protection to ensure human well-being. He proposes an alternative paradigm, integral ecology, that views creation holistically as an interconnected web of beings with

God-given intrinsic value. Central to CST is the notion of conversion, that is, the personal or societal transformation toward a life in intimate relationship with God. In light of the socio-ecological biodiversity crisis, a radical ecological conversion is needed that will reorient the existential concern of individuals for nonhuman life, and transform socio-economic structures, including those of the capitalist economic system that currently dominates trade globally.

7. Catholic actors have a unique opportunity to help bring about a radical ecological conversion and influence systemic change.

Catholic advocacy is uniquely placed to initiate a cultural transition toward greater concern for nonhuman life and must rise to the challenge. Informed by CST, Catholics as individuals and as Church should not resist undergoing a radical ecological conversion themselves as well as standing up and adding their voices to influence key socio-ecological policies and practices. They can help to free conservation efforts from underlying technocratic tendencies to overemphasise human benefits from ecosystem health in favour of a more integral paradigm that views life as valuable for its own sake. They can also help make the virtue of solidarity a central concern of the global community and inspire creative ways of translating it into practice.

8. Listen to and lift up the indigenous voices.

Western industrial society has largely lost such an integral perspective on human existence, but it is still very much alive in the worldviews and lives of indigenous cultures around the world. As Pope Francis points out in his Post-Synodal Apostolic Exhortation *Querida Amazonia*, the ancestral cultures of the Amazonian peoples fully embraced this wisdom and to this day exist in intimate contact with the natural environment. They live, as it were, “in vital synthesis with [their] surroundings,” seeing

the forest not as a simple commodity that can and should be exploited to its maximum yield, but rather as “a being (...) with which [they] have to relate” (paragraph 32). Their wisdom of being in the world is testament to their intimate connection with all in nature and in turn with the Creator. The 2020 Human Development Report also acknowledges this wisdom from indigenous peoples and its implications for reshaping our conception of development.

9. Urgent scaled up advocacy to ensure ambitious outcomes of forthcoming biodiversity policymaking and increased political will for implementation is essential.

In 2021 there are some key opportunities to leverage change in the international process of biodiversity related policymaking. Above all, there is the CBD COP 15, where the Post-2020 Global Biodiversity Framework will be adopted. Even though the participatory preparation of the document and its review has been completed, Catholic actors should participate at the conference. Catholic actors should pursue and promote a coherent agenda, connecting social, environmental and economic goals in relation to biodiversity collapse, the climate crisis and the economic decision-making which underpins them. Given the preferential option for the poor, the Catholic Church and its organisations should align in particular with those who suffer most from this biodiversity collapse, that is, those whose lives directly depend on it such as indigenous peoples, subsistence farmers, and women. Women not only form a large part of subsistence farming worldwide, but also bear the greatest burden of accessing water, food and cooking fuel.

Each year sees the disappearance of thousands of plant and animal species which we will never know, which our children will never see, because they have been lost forever. The great majority become extinct for reasons related to human activity. Because of us, thousands of species will no longer give glory to God by their very existence, nor convey their message to us. We have no such right.

Pope Francis, Laudato Si' [33]

INTRODUCTION

There is a growing scientific consensus that the current anthropogenic loss of biological diversity is the greatest ecological challenge of our time. We are driving species to extinction at around 100 to 1000 times the background rate, that is, the degree of loss independent of human activity. So dramatic is this depletion that biologists are now speaking of the sixth mass extinction event in Earth's history. Unlike the previous five, this mass extinction is unfolding in terms of decades rather than millions of years, constantly gaining momentum at an unprecedented rate, so that eventually it will become impossible for the system to adapt any further. At that point, a catastrophic collapse will be virtually unavoidable, jeopardising the survival of all organisms, humans included.

Already today humanity is suffering the bitter consequences of an eroding biodiversity: millions of people are losing their livelihoods, poverty is growing, food and water are becoming increasingly scarce resources, climate change is accelerating, and weather is becoming less predictable. Even zoonotic diseases like COVID-19 are reaching pandemic levels more easily. It is mostly the poor who currently bear the brunt of this socio-ecological biodiversity crisis, but before too long its already palpable effects will become a clear and present danger to even the most privileged. If we want today's children to reach middle age without paying a substantial price in terms of ecological, physical, psychological, spiritual, or economic well-being, immediate, concrete, and far-reaching actions are needed to save the diversity of life and the systems in which it flourishes.

On the whole, the biodiversity crisis has been slow in attracting the necessary attention of the public, policy makers, and also of the Catholic Church along with all other faith traditions. Concern for Earth's other, less critically threatened systems, above all else the climate, is dominating public discourse and media coverage. As a result, the perception of the ecological crisis and its social correlates has become somewhat slanted, further jeopardising environmental health and human welfare. It is imperative to assume a more holistic perspective that underlines the interdependence of all Earth systems and acknowledges the importance of attending to the most threatened systems with the same or even greater urgency as those already at the centre of our awareness.

Considering the ecological and social extent of the crisis, such a holistic approach will have to include moral considerations; how we should relate to other creatures and to one another is not apparent from the scientific data but requires an ethical reflection on that data in light of human values. The present report seeks to provide such an analysis in order to inform already existing considerations within the Roman Catholic Church and

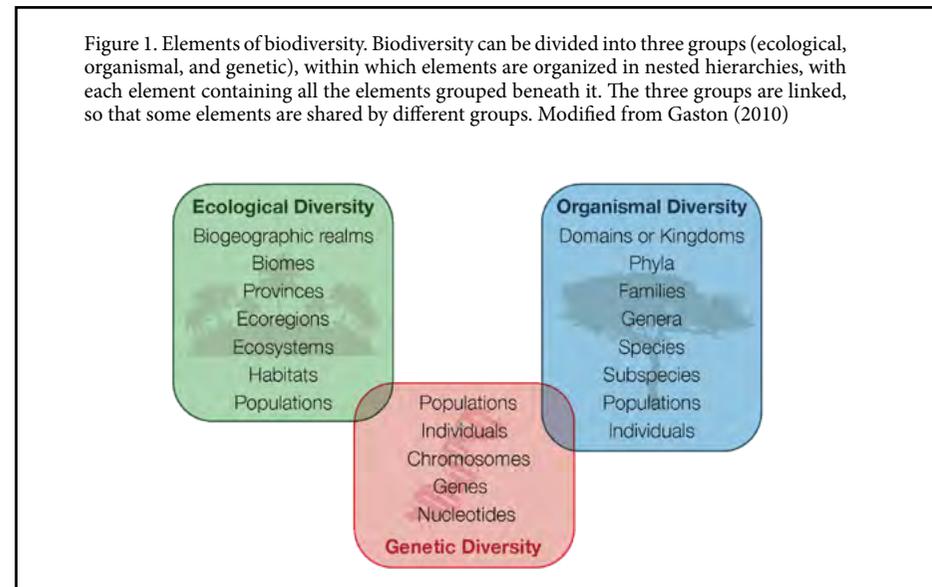
complement its policy recommendations on climate change and other socio-ecological matters. To that end, it will first review the biology of diversity, including the current state of the biosphere in light of human activities, summarise international efforts to protect biodiversity, and after outlining the main principles of Catholic Social Teaching (CST), offer some suggestions as to what steps might be taken by Catholic actors and others concerned for the care of our common home.

THE DIVERSITY OF LIFE

Since its earliest emergence, some 3.5 billion years ago, life on Earth has evolved into a vast variety of forms that exist virtually everywhere from the top of the Himalayan mountains to deep within volcanic rocks beneath the seafloor. Understanding the spatial and temporal distribution patterns of this biological diversity, or biodiversity for short, is the central objective of ecology.⁶ Yet, despite this focus, there still is no consensus on how to define biological diversity. The concept is still evolving and being re-defined, especially since inter- and transdisciplinary approaches are becoming increasingly important for scientific assessments and conservation policies. Simply put, though, biological diversity could be summarised as “the variety of life, in all its many manifestations.”

The biosphere is indeed a complex web of life. However, biologists have tried to make sense of it by distinguishing three levels of variation (Figure 1). Underlying all higher levels of variation is genetic diversity, which encompasses the genetic coding that structures organisms (nucleotides, genes, chromosomes) and the variation in genetic make-up between individuals within a population and between populations. Organismal diversity begins at the level of individuals and moves upward to the variability of higher-order taxonomical elements, like subspecies, species, genera, families, phyla, kingdoms, and domains. Finally, differences on

the scales of population, through habitats, to ecosystems, ecoregions, provinces, biomes, and biogeographic realms are subsumed under ecological diversity. The strength of this three-pronged typology is the nested hierarchy in which elements are organised within their groups, so that higher order elements contain lower ones. It is readily evident that no single element can be viewed independently of any other; a permanent loss at one level will always imply substantial adverse degradation at all the other levels



Quantifying the actual rate of change in the world’s biological diversity is important in order to identify which groups of organisms (taxa) are potentially in danger, determine regions of concern, and assess whether measures in place to slow or reverse the rate of decline are successful. Here, a general metric generating one indicator of the overall global situation

can help focus efforts regarding the protection of biodiversity. One such approach is the Living Planet Index (LPI), where global average trends in populations of vertebrate species from terrestrial, freshwater, and marine habitats are distilled from published data and compared to population numbers from 1970. Managed by the World Wildlife Fund for Nature (WWF) and the Zoological Society of London, the LPI is reported every two years, and has become an authoritative source of data on the state of global biodiversity. Since its first conception in 1997, the LPI has shown an increasing decline in wildlife populations, implying that biodiversity is under serious threat.

THE BENEFITS OF BIODIVERSITY

Ecosystem Services

Ecosystems are dynamic communities of organisms in relationship with one another and with their non-living surroundings. When healthy, these complex functional entities of biotic and abiotic components are characterised by the ability to maintain their biological diversity (organisation), generate biomass at a specific rate (function), and rebound from perturbations such as those caused by fire, flood, drought, and so on (resilience). Organisms are essential for maintaining ecosystem health and, in turn, receive from their ecosystems a variety of benefits collectively known as ecosystem services.

Humans, too, are an intrinsic part of their ecosystems and, as such, utterly dependent on their specific services, even though our increasingly technology-dominated lifestyles might mistakenly suggest otherwise. Plants, for instance, are not only making solar energy available to the entire system by incorporating it through photosynthesis, but are also filtering the air, removing poisonous carbon dioxide (CO₂) and, in

exchange, releasing oxygen (O₂) essential for human life. In so doing, plants help to mitigate extreme weather events and stabilise the climate, making them an important ally in fighting anthropogenic climate change. Microorganisms decompose and detoxify detritus, making available such important chemicals as nitrogen or phosphate, while simultaneously removing harmful substances from the system. They are involved in generating and maintaining nutrient-rich soil without which agriculture would not be possible. Over 90% of the approximately 250,000 species of sexually reproducing flowering plants rely on animals for their pollination.

And while the most essential staple crops, such as wheat, corn, rice, soybeans and sorghum, are either wind pollinated or self-pollinating, many economically valuable fruits and vegetables depend on pollination through insects. Finally, not only do thousands of plant, animal, and microorganism species supply us with food and shelter, but they are also of cultural, aesthetic and spiritual value, and are sources of compounds extracted from numerous organisms for use in medicine and pharmaceuticals.

Biodiversity and Ecosystem Function

There is now mounting empirical evidence that biodiversity is linked to ecosystem function and in turn to ecosystem services. Ecosystems display great sensitivity to changes in biodiversity, with system health deteriorating when diversity is in decline. For example, numerous studies have shown that the decrease in grassland plant diversity will severely affect ecosystem productivity. In one investigation, changing the number of plant species from four to 16 caused the same increase in productivity (biomass) as would the addition of 54 kg fertiliser per hectare per year. Equivalently, commercial overexploitation of marine vertebrates and invertebrates has lowered ocean productivity both on a local and at times on an even greater scale. Along the U.S. East Coast, long-lasting excessive harvesting combined with environmental pollution, shellfish diseases such as MSX

(*Haplosporidium nelsoni*) and dermo (*Perkinsus marinus*), and possibly the overfishing of apex predators (large shark species) has caused oyster populations to deteriorate so drastically that a century-old fishery collapsed and has not recovered since. Deforestation in the tropics has led to changes in local or regional climate, causing more frequent floods and droughts along with reduced productivity in local agricultural systems. Moreover, the clearing of wide areas of tropical forest also exacerbates the risk and incidence of infectious diseases such as West Nile Virus or Lyme disease.

Nature's contributions to human well-being are not equally distributed across space, time, or society. Giving priority to one ecosystem service (e.g., food production) will inevitably affect other contributions negatively, which can benefit some people, but only at the expense of others, especially of the most vulnerable. Saving biodiversity and, with it, assuring global ecosystem health, is ultimately as much an ecological responsibility as it is a social one. Never before has so much food and energy been supplied to people, with food production being sufficient to satisfy global needs many times over, and yet 11% of the world's population is undernourished. Twenty per cent of world-wide premature mortality is related to both the undernourishment of those suffering necessitous circumstances, and the obesity of those living in economic plenty. Developing countries are losing food because they lack resources to ensure efficient processing, storage, and distribution, while in countries like the USA or the United Kingdom more than a third of all food, worth billions of Euros, gets thrown away. The equitable distribution of wealth along with more sustainable behaviour could feed 300 million people in Africa alone. Re-establishing ecological balance is clearly a prerequisite for planetary well-being, possibly even the survival of the biosphere as we know it, but it is also the necessary condition for the possibility of social equity. To protect biodiversity is to empower the poor and guarantee a good life for all.

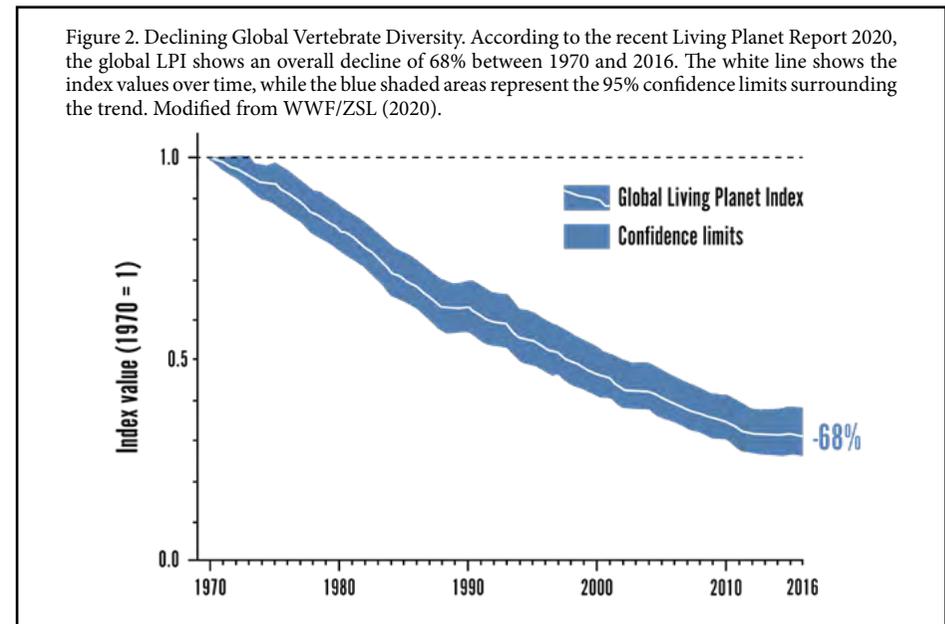
BIOLOGICAL DIVERSITY UNDER THREAT

With the beginning of the industrial revolution, humanity's destructive impact on the planet's ecology became more far-reaching and long-lasting. Of course, humans have always played a more or less relevant part in the extinction of species, as, for example, in the case of the loss of some Pleistocene megafauna (e.g., the mammoth, mastodon, ground sloth, and sabre-toothed cat). However, these events differed from today's situation in that fewer species were affected, human activity was local in its effects, and that extinctions were not due to human activity alone, but further aggravated by pressures such as natural climate change. Even without humans, extinction is a normal part of evolution. Organisms struggle for resources and can permanently outcompete others as a consequence. Today, however, anthropogenic biodiversity loss is global in scale, driven by overexploitation paired with increased land use changes, habitat destruction, pollution, and human-caused climate change. In the past 70 years, this destructive impact has constantly gained in extent and momentum, a phenomenon referred to as the "Great Acceleration". By now, it has reached dimensions that rival those of the most dramatic extinction events in Earth history. Up to one million species of plants and animals face extinction.

The Loss of Life

In its recent Living Planet Report, the WWF assesses the loss of vertebrate wildlife between 1970 and 2016 at an average of 68% (Figure 2). Only 4 years earlier, it was at 58%, highlighting the tremendous velocity at which population loss is growing. The primary drivers of this extinction are habitat destruction and the invasion of long-established ecosystems by non-native species, though climate change could be become yet another. According to the 2019

global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 75% of Earth's ice-free surface has been altered significantly, 66 % of the ocean area has been impacted, and 85% of wetlands have been lost. In economic terms, this equates to an overall loss of "natural capital" (the planet's stock of renewable and non-renewable natural resources) per person of nearly 40% since the early 1990s, while at the same time produced capital (generated from human activity affecting natural capital) has doubled, and human capital (a stock of capabilities, which can yield a flow of services) has increased by 13%.



Species abundance and other biodiversity elements are not declining uniformly throughout the world, but rather at different rates in different areas, habitats, or ecosystems. Populations in freshwater systems have been

depleted by an average of 84%, while the reduction of populations in the tropical subregions reached 94%, with Latin America/Caribbean and Africa showing the steepest loss (94% and 65%, respectively). This means that the most extensive decline in biodiversity occurs in those areas where some of the most vulnerable people live, namely indigenous, traditional, and rural communities. For these people, who depend most directly on the services of their home ecosystems, the ramifications of this environmental destruction are tremendous.

Invertebrates comprise a far greater portion of the biosphere in both species number and biomass than the vertebrates reported in the LPI. They are important for the food chain, providing energy for a great variety of vertebrates, including birds, reptiles, amphibians, and fish. Insects play a vital role as pollinators in plant life and agriculture. Over the past 50 years, their diversity has declined continuously, and in some parts of the world it has reached dramatic levels. About 40% of all insects may become extinct over the next few decades. In protected areas in Germany, the average biomass of airborne insects has been reduced by 76% (up to 82% in midsummer) in just 27 years. Besides habitat destruction, non-organic farming methods employing insecticides are responsible. In fact, in some German cities the diversity of Hymenoptera is significantly greater than in rural farming communities. The loss of insect diversity is jeopardising agriculture, but even more significantly, the food chain itself.

Plants are of particular importance to the Earth's systems. Firstly, they are responsible for maintaining the planet's atmosphere by taking up CO₂, a major climate change driver, and releasing oxygen. In fact, it was cyanobacteria, blue-green algae, which around 2.4 to 2.1 billion years ago began to oxygenate the atmosphere and, thus, enabled life to move onto land. Today, the 21% of oxygen in our atmosphere is no longer maintained by cyanobacteria alone, but also and significantly by large forests, such as the Amazonian rainforest, which is why these forests are often referred

to as the "lungs" of the planet. Moreover, photosynthesis, the process through which plants produce atmospheric oxygen, primarily generates carbohydrates (sugars, starches and fibres), which, in turn, constitute the energy source for virtually all other life on Earth. Without this primary production, life would cease to exist.

The actual status of plant diversity is unclear, largely because plants are not well represented on the Red List and are often neglected in favour of charismatic vertebrates. Nevertheless, the available data is quite worrisome: one in five of the assessed plant species is threatened with extinction (22%), most of them in the tropics. That renders plant extinctions twice as extensive as that of mammals, birds, and amphibians combined.

The Amazon – A Cautionary Tale

Forests and their rich biological diversity are particularly susceptible to external pressures, and tropical forests have suffered the most, with the Amazonian rainforest being a tragic case in point. By June 2020, deforestation in Brazil alone had reached more than 11,000 square kilometres annually, an area the size of Jamaica. Although only about half the size of the historic peak of 2004, when a total of 22,772 square kilometres were clear-cut, these numbers still almost triple the annual 3,925 square kilometre limit set by Brazil's climate change law. With an increase in logging of 47% and 9.5% compared to 2018 and 2019, respectively, this is the highest annual loss in the decade. It translates into a CO₂ emission of 648 Tg (or 648 million tons of CO₂). A serious side-effect of deforestation are fires, generating large amounts of smoke emissions that adversely affect respiratory health among the people of the Amazon, further increasing the vulnerability of indigenous, traditional, and rural people. Another, equally devastating consequence of logging in the Amazonian forest is the loss of soil through erosion, leading to

severe flooding. Most of the nutrients in the rainforests are stored in the biomass aboveground, which leaves the soil nutrient deficient. When trees are removed, their root systems no longer hold together the soil, nor do they absorb water during the rainy season. As a result, the rainwater washes away the topsoil with the remaining nutrients, making regrowth of the forest virtually impossible. Along with the plants, the extremely rich animal diversity of the forest is lost.

The Amazon's biodiversity destruction is rooted in human systems. Cattle now populate 70% of cleared lands in the Brazilian Amazon making Brazil the second largest herd raising country in the world. Brazil now has more cows than people, 40% of them in the Amazon. A chain of actors from cattle ranchers through to multinational beef traders, their US and European auditors, international financiers, and the governments regulating them all play a part in making this happen. This allows close to 390,000 ranches to breed, buy, and sell cattle at such levels that beef production in Brazil alone is now the leading driver of deforestation emissions across Latin America.

The traditional way of life of indigenous peoples living in the tropical rain forest, in contrast, is as sustainable as slash-and-burn agriculture is destructive. According to a recent report, their contribution per capita to climate change mitigation offsets the entire per capita emissions of the top one per cent of the global income distribution. By putting them at risk along with the forest, those destroying the Amazon are magnifying the global crisis for everyone on the planet.

What happens to the Amazon is mirrored in other parts of the world. African and South-East Asian forests are experiencing similar destructions, and here, too, it is the most vulnerable who pay the highest price.

Threats to forests, which harbour most of Earth's biological diversity,

are numerous and not confined to logging. Currently over 100 million hectares, or 1 million square kilometres worldwide are adversely affected by other hazards, such as fires, pests, diseases, invasive species, drought, and adverse weather events. The Global Assessment Report on Biodiversity and Ecosystem Services 2019 ranked in descending order the five direct drivers of change in nature with the largest relative global impacts so far: "(1) changes in land and sea use; (2) direct exploitation of organisms; (3) climate change; (4) pollution and (5) invasive alien species." Here again, the connection between biodiversity, ecosystem health, and human systems becomes apparent.

Drivers of Extinction

The Living Planet Report also shows geographic variation in the order and the extent of the various drivers of biodiversity decline. In all five geographic regions (North America, Latin America and the Caribbean, Europe and Central Asia, Africa, Asia Pacific) the dominant cause for population and species loss was land use change, the anthropogenic conversion of land for residential, agricultural, recreational, transportation, and commercial uses. It was responsible for 52.5%, 57.9%, 51.2%, 45.9%, and 43%, respectively. Overexploitation either by unsustainable hunting, poaching, or harvesting, or by unintentional killing (e.g., bycatch in fisheries) is the second largest pressure on biodiversity (17.9%, 19.7%, 21.8%, 35.5% and 26.9%). In many regions of the world, invasive species have managed to outcompete endemic populations and have caused tremendous damage. They are responsible for 14.4%, 10.9%, 12.2%, 11.6%, and 14% in the respective geographic regions. The impact of environmental pollution and the changing climate on the diversity of life are less prominent, though that does not mean they should be underestimated. Pollution caused 10.2%, 7.5%, 2.3%, 2.8%, and 11%, whereas climate change had an impact of 5%, 4%, 12.5%, 4.7%, and 5% in the above five geographical regions, respectively.

Too Many Using Too Much?

Another driver of extinction mentioned frequently in the literature on the biodiversity crisis is overpopulation. With a population of currently approximately 7.84 billion, the argument goes, the capacity of the planet may have been reached, or even overstepped. Accordingly, the combined impact of all the pressures on the biosphere discussed above is merely a function of the overall growth in the number of humans living on Earth. More people require more resources, thus increasing the detrimental impact humans have on nature.

Researchers in favour of this interpretation project that the world population will reach 8.6 billion by 2030, 9.8 billion by 2050, and, if allowed to continue unchecked, 11.2 billion by 2100. On average the world population grows by 81 billion people annually, with only nine countries being responsible for half of this increase: India, Nigeria, Democratic Republic of Congo, Pakistan, Ethiopia, United Republic of Tanzania, USA, Uganda, and Indonesia. Fifty-five per cent of all humans today live in urban areas, but that number is expected to reach 65% by 2050. Clearly, these figures are not sustainable. However, a recent study, modelling population dynamics as a function of fertility, migration, and mortality rates, paints a slightly different picture. The authors forecast that the global population will peak at 9.73 billion in 2064, after which it will decline to 8.79 billion in 2100. By then, the total fertility rate will tend towards 1.5 globally. This is a much more promising scenario, although in the end, how many humans the Earth can sustain depends on the rate at which they consume natural resources and how they manage to reduce their adverse impact on nature.

For at least the past 50 years, during the Great Acceleration, our demands on nature and its resources have by far exceeded what the planet can regenerate. Our ecological footprint, that is, the sum of all ecological

services people demand, is far too big to be contained by Earth's biocapacity (biologically productive area). At our present rate of consumption, we require 1.6 Earths to sustain our unsustainable lifestyle.

It is important to remember that this consumption is completely unbalanced, with the wealthiest 20% of the world's population using 80% of global resources. Growth rates in these countries are much lower in comparison to mid- and low-income countries, underscoring on the one hand the role children in developing countries play in the support of the elderly and as an indispensable part of the labour force, and on the other the high infant mortality associated with limited health care in places of need. The primary reason for lower fertility rates in wealthy countries is the high degree of education, especially among girls and women. There is now mounting evidence that female education, more than any other factor, including contraception, is capable of curbing population growth. However, the main driver for ecological degradation is the massive over-consumption by the very few 'haves', rather than the high fertility rate of the very many 'have-nots'. Since consumption and degree of education are positively correlated, global education for all must always be integral, that is, oriented toward developing sustainable attitudes and habits.

While overpopulation does constitute a serious problem impacting biodiversity, it would be dangerously simplistic to consider it the main driver of extinction and all other ecological and social predicaments of today's technocratic global society.

POLICY EFFORTS ON THE INTERNATIONAL LEVEL

The Convention on Biological Diversity

Even though the crisis of biodiversity loss has not gained as much public attention as the changing climate, among international and national policy makers it has been an issue of interest for many years. At the 1992 UN Earth Summit in Rio de Janeiro, the Convention on Biological Diversity (CBD) was opened for signatures and entered into force on 29 December 1993, signed by 168 nations. The multilateral treaty is committed to:

- (1) the conservation of biological diversity,
- (2) the sustainable use of the components of biological diversity, and
- (3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Generally speaking, the CBD is concerned with all possible or actual threats to biodiversity and to ecosystem function and services, including climate change, urbanisation, land use change, and other drivers of extinction. It seeks to implement its targets by facilitating the development of national strategies for its now 196 member states through scientific assessments, the development of tools, incentives and processes, the transfer of technologies and good practices, and the full and active involvement of relevant stakeholders including indigenous and local communities, young people, NGOs, women, and the business community. Membership obliges all member states (“Parties”) to put into action the provisions of the treaty.

In addition to the CBD, two supplementary agreements address specific issues associated with biodiversity and its excessive diminishment through human activities. Effective since 2003, the Cartagena Protocol on Biosafety is intended to protect biological diversity from the potential risks posed by living modified organisms (LMOs) resulting from modern biotechnology by securing their safe handling, transport, and use. The Nagoya Protocol on Access and Benefit-Sharing entered into force in 2014 with the objective of ensuring fair distribution of the advantages and gains arising from the utilisation of genetic resources (i.e., research and use of genetic material derived from any kind of organism in the life sciences and the development of commercial products).

Like its more famous cousin, the UN Intergovernmental Panel on Climate Change (IPCC), the CBD has as its governing body a Conference of the Parties (COP), which meets periodically and strives to advance implementation of the Convention through negotiated decisions signed by the member states. So far, there have been 14 ordinary meetings of the COP, along with one extraordinary meeting to adopt the Biosafety Protocol. Between 1994 and 1996, the COP was held annually, but since then meetings have been held every two years. In 2021, the CBD COP 15 will be held in Kunming, China, though considering the COVID-19 pandemic the exact date still awaits confirmation.

The CBD COP has identified seven central thematic programs of work corresponding to some of the main biomes of the planet (agricultural biodiversity, dry and sub-humid lands biodiversity, forest biodiversity, inland waters biodiversity, island biodiversity, marine and coastal biodiversity, and mountain biodiversity). Their aim is to establish a vision for future work and to establish basic principles to guide that work. Periodically, the COP along with its intergovernmental scientific advisory body (Subsidiary Body on Scientific, Technical and Technological Advice, SBSTTA) reviews the state of implementation and reports this in their Global Biodiversity Outlook, of which the fifth was published in 2020.

The Aichi Targets – Saving Biodiversity by 2020

One of many cross-cutting issues the CBD established on key matters relevant to all seven program areas are the Aichi Biodiversity Targets. Similar to the Sustainable Development Goals (SDGs) of the UN Agenda 2030, the Aichi Targets describe a set of objectives subsumed under the CBD Strategic Plan for Biodiversity. In October of 2010, the plan was adopted at the tenth meeting of the Conference of Parties held in Nagoya, Aichi Prefecture, Japan, for the 2011-2020 period. It was intended to provide an overarching framework on biodiversity for the entire United Nations System and all other partners involved in biodiversity management and policy development. Target 17 calls for the establishment of strategies on the national level as laid out in the UN National Biodiversity Strategies and Action Plans (NBSAPs). Consequently, all member states were committed to translate the general internationally agreed upon Aichi Targets into adequate national biodiversity strategies and action plans within two years. Currently, 192 of the 196 Parties (98%) have developed at least one NBSAP.

The 20 Aichi Targets with their 60 specific elements, organised around five strategic goals, were no less ambitious than the 17 SDGs and their 169 targets released five years later in 2015. By 2020, the Strategic Plan for Biodiversity aimed to raise general awareness of the crisis, reduce the direct pressures of extinction and promote sustainable use, improve the state of biodiversity by protecting ecosystems, species and genetic diversity, enhance the benefits to all from biodiversity and ecosystem services, and finally enhance implementation through participatory planning, knowledge management and capacity building. Already at the mid-term, the Global Biodiversity Outlook 2014 concluded that although progress had been made for most Aichi Targets, it was insufficient for the achievement of the targets by 2020. This concern was confirmed in the Global Biodiversity Outlook 2020. Not one of

the 20 Aichi Targets had been fully achieved at the global level; merely six targets were achieved partially.

Of the 60 specific elements of the Aichi Targets only seven had been achieved, 38 showed progress, and 13 showed either no progression or even regression away from the set targets. For two elements the outcome is unknown. Some progress was made on the national level, with more than a third (34%) of the national targets being on track to be met or exceeded (3%). Fifty-one per cent of the national targets improved, but not sufficiently to meet the targets set by the member states for themselves. No significant progress was made in 11% of the national targets, while only 1% moved in the wrong direction. All in all, here, too, the results are at best hopeful, though the fact that national targets usually align poorly with the Aichi Targets in terms of scope and ambition makes the results less impressive. Only 23% of all national targets fit the international Aichi Targets and just about a tenth of all national targets are both similar to the Aichi Targets and on track to be met. The Global Biodiversity Outlook 2020 concludes that this collective failure to meet the set goals in full was due to insufficient commitment on the part of the member states.

The New Deal for Nature and People

The limited success of the Aichi Biodiversity Targets has made it necessary to develop a Post-2020 Global Biodiversity Framework which is to be adopted by the CBD during the 15th meeting of the Conference of Parties. At the time of writing this report, the CBD is preparing this New Deal for Nature and People in a comprehensive and participatory process that allows various stakeholders to contribute to its development. An information paper of the CBD lays out the consultation process, including provisions for global, regional, and thematic consultation meetings. Given the state of the ongoing loss of biological diversity and the scope of the Post-2020 Biodiversity Framework, COP 15 is viewed

by many as the most important biodiversity meeting in a decade. Some non-governmental organisations and other stakeholders have already prepared extensive discussion papers, outlining in detail what focus the New Deal for Nature and People should have. Clearly, this would be an important opportunity for Catholic biodiversity advocates to bring to bear their integral perspective on the socio-ecological biodiversity crisis.

The Sustainable Development Goals

As mentioned above, in 2015 the United Nations General passed the UN “Agenda 2030,” an action plan to achieve a better and more sustainable future for all by 2030. Its 17 SDGs with their 169 targets address a variety of interrelated social, ecological, and economic focus areas, none of which can be adequately developed in isolation.

At first glance, only two of the SDGs, SDGs 14 and SDG 15, are of immediate relevance for the issue of declining biological diversity, attending to life below water and on land, respectively. But of course, biodiversity and ecosystem health are essential to the achievement of many, if not most of the remaining thematic goals.

Neither poverty (SDG 1) nor hunger (SDG 2) can be ended without a healthy ecosystem providing the necessary services. As the COVID-19 pandemic has so painfully demonstrated, ensuring good health and well-being (SDG 3) requires a rich natural abundance of species and other biodiversity elements to avoid the spread of zoonotic diseases.

Providing decent work to ensure sustainable economic growth (SDG 8) will only succeed when the foundation for such work is protected. Billions of people are directly dependent on ecosystem services, and their economic situation can only be maintained or improved in case of functioning ecosystems with their natural biological diversity in place.

Overexploitation of biological resources by international corporations (e.g., overfishing or logging etc.) has further exacerbated the social and economic impacts of globalisation on those directly dependent on these sources. Traditional fisheries in many of the poorest regions of the planet have collapsed, and deforestation in the tropics led to the worst decline in population diversity in addition to natural catastrophes such as floods and diseases, all of which could have been prevented given healthy local and global ecosystems. Hence, SDG 10, which seeks to significantly reduce inequalities, depends on the sustainable use of ecosystem services and the protection of wildlife.

That transforming mega cities and other urban areas into sustainable communities (SDG 11) is directly connected to ecosystem health is obvious, as is the fact that responsible consumption and production (SDG 12) requires an efficient and sustainable use of natural resources. Climate change is becoming one of the greatest drivers of extinction, so clearly SDG 13 on climate action is of immediate importance for biodiversity. In summary, the Agenda 2030 underscores human dependence on a healthy biosphere, while at the same time virtually all the SDGs are relevant for the protection of biodiversity and ecosystem health.

Overall, member states of the UN have adopted the SDGs and developed national strategies to achieve the targets set by the Agenda 2030. Nevertheless, there is much left to be done. One very real problem is that institutions and organisations trying to implement individual SDGs might focus too narrowly on the specific targets of the individual goals, thus ignoring necessary cross-cutting issues. National or regional political interests, often understandable, but obstructive nonetheless, can undermine the intended purpose of certain goals. For instance, both SDG 8 and 9 call for an increase of the annual gross domestic product growth, which might be economically sound, but socially and ecologically problematic. At this point, there are several trade-offs between reaching

the objectives of the CBD and attaining the SDGs, but according to the CBD these can be avoided or minimised through coherent and integrated decision making. This coherence can be helped along by an inclusive ethical and moral vision highlighting the importance of social, economic, and ecological justice. Here, the social teachings of the Catholic Church might offer a helpful perspective.

CATHOLIC SOCIAL TEACHING AND THE BIODIVERSITY CRISIS

Twenty years ago, in a general audience, Pope John Paul II called for an “ecological conversion” in response to the disastrous state of God’s creation. In the Pope’s analysis, the human being no longer acts as the earthly steward in God’s stead, caring for and protecting creation, but rather as an “autonomous despot,” selfishly destroying what they are meant to safeguard. To John Paul II there is much more at stake here than just a “physical” ecology that is concerned with safeguarding biodiversity and ecosystems. By acting so recklessly towards nonhuman life, we also jeopardise “a ‘human’ ecology which makes the existence of creatures more dignified, by protecting the fundamental good of life in all its manifestations and by preparing for future generations an environment more in conformity with the Creator’s plan.” This appeal for altering the behaviour of humans and institutions toward creation moved the socio-ecological crisis into the focus of modern CST.

Ecological Virtues and Sins

Articulated through a tradition of papal, conciliar, and episcopal documents, CST aims at building a just society and living lives of holiness amidst the challenges of modern society. It fully acknowledges the intricate connection between human society and the well-being of all creatures, thus inextricably linking social and ecological justice as two sides of the same coin. From this perspective, then, safeguarding “God’s handiwork”

is, as Pope Francis puts it in his encyclical *Laudato Si’*, a “vocation that is essential to a life of virtue” and not merely an “optional or secondary aspect of our Christian experience.” It is the relationship with the natural world, created by God and found to be good (Gen 1:4,10,12,18,21,25), that constitutes the human being, and in which the still deeper relationship between human being and God comes to the fore. Hence, selfishly destroying biological diversity, the multitude of evolving creatures, is not only an act against our God-given ontological disposition, it is also and, above all, an act against God. It is an ecological sin.

It has been said that human technological ingenuity married to the hypothetico-deductive method of the modern natural sciences are to blame for the socio-ecological crisis of our days. For the Church, however, neither science nor technology are intrinsically evil; on the contrary, they are, good in themselves, the “wonderful product of a God-given human creativity,” appropriate means to overcome suffering and to enable all humans to live their lives to the fullest potential. From the perspective of CST even the advances in biotechnology, so often the cause for ethical contentions both in medicine and agriculture, are to be welcomed in principle for how they can improve human life. Yet, with these newly found powers comes an ever-greater responsibility. According to Catholic teaching, human beings were created in the divine image (Gen 1:27) and received a mandate to “subject” to themselves the Earth and all that it contains. But they were called to “govern the world with justice and holiness.” It is precisely because of our particular ontological status that we have the duty to guard God’s creation, which does not belong to us but is placed into our care so that as stewards we ensure its well-being. The use of science and technology must be restrained by sound ethics and a spirituality that acknowledges and highlights the intrinsic value of nonhuman creatures and of ecosystems.

Creation's Shared Origin

Pope Francis emphasises this responsibility in *Laudato Si'*, arguing that in this created world that was given to us to tend carefully, all things are interconnected. Like all documents comprising CST, this one too builds its argument on a strong theological foundation. Central here is a theology of creation, which the text approaches from the perspective of theology and science. Theology of creation is an interdisciplinary sub-discipline of fundamental theology that takes insights from both fields of inquiry and seeks to establish consonance between their respective claims. In other words, it embraces the notion that all things are connected, which is key to both the natural sciences and a theology of creation. While the sciences observe interconnectedness on all levels, from the underlying physicochemical mechanisms to the complex interdependent relationships of organisms, theology finds it in the divine creation of all things, living or non-living, human or not. It is from this shared origin in God that all creatures derive their intrinsic value independently from whatever economic potential they may or may not have for humanity.

Listening to the Indigenous Voices

Western industrial society has largely lost such an integral perspective on human existence, but it is still very much alive in the worldviews and lives of indigenous cultures around the world. As Pope Francis points out in his Post-Synodal Apostolic Exhortation *Querida Amazonia*, the ancestral cultures of the Amazonian peoples fully embraced this wisdom and to this day exist in intimate contact with the natural environment. They live, as it were, “in vital synthesis with [their] surroundings,” seeing the forest not as a simple commodity that can and should be exploited to its maximum yield, but rather as “a being (...) with which [they] have to relate”. Their view of human existence is truly cosmic in scope, and with their care for all life – human and nonhuman – they show that “what the

law requires is written on their hearts, to which their own conscience also bears witness” (Rom 2:15). Their wisdom of being in the world is testament to their intimate connection with all in nature and in turn with the Creator.

An Integral Paradigm to Highlight the Intrinsic Value of All Creatures

A core message of CST today is that a return to integrality is essential for finding an efficient and sustainable solution to the current socio-ecological biodiversity crisis. Therefore, echoing his predecessor John Paul II, Pope Francis calls for an ecological conversion both on the part of the individual as well as of society as a whole. His widely well-received encyclical *Laudato Si'* may be seen as an attempt to initiate a transdisciplinary conversation on exactly how to achieve just that. In it, the Pope identifies the globalisation of what he refers to as the “technocratic paradigm” as the root cause of our current socio-ecological crisis. By technocratic paradigm, the Pope means an intellectual framework that shapes the way most of us today interact with the world around us. With regards to biological diversity, its underlying assumption could be summarised as the belief that science and technology allow us to assume control over all organisms at every level of their diversity. Plants and animals are reduced to no more than raw materials for human use, rather than living realities, intrinsically valuable in their own right. *Laudato Si'* opposes the technocratic paradigm with a holistic framework referred to as “integral ecology,” which presupposes the aforementioned interconnectedness of all things along with their God-given intrinsic values. According to this diametrically opposed way of envisioning reality nature is no longer ethically neutral. Humans must consider their responsibilities to justice in terms of their relationships to God, to other humans (especially the poor), and to other all other creatures. The challenge is how to transition global society from the technocratic to the integral paradigm, so that once again we come to understand other creatures as worthy of our respect.

Radical Ecological Conversion

Whatever such a process might look like, it must go to the roots of the person undergoing the conversion. It also has to seep into the foundations of our societal self-understanding, which is why one could speak here of a radical ecological conversion (from the Latin radix for root). Such a personal conversion could be envisaged as a fundamental reorientation of existential concern onto the natural world and onto the integral paradigm. In other words, the suffering of biodiversity at our hands must take on no less than primary relevance: “Our goal is (...) to become painfully aware, to dare to turn what is happening to the world into our own personal suffering” (LS 19).

Societal transformation would certainly have to involve a variety of changes of which a shift from our current technocratic capitalist economic model to an integral common good approach would be crucial. What characterises this common good is that it belongs to all, and that it remains common, simply because it is indivisible and because “only together is it possible to attain it, increase it and safeguard its effectiveness, with regard also to the future.” Common good does not mean a resource that is free for anyone to use who can afford to harvest it. The oceans and all life in them are indeed a common good, but only insofar as they are being used wisely so that all who depend on them can benefit equally from them in a sustainable fashion. Legally, fish stocks outside of territorial waters may “belong” to anyone, allowing those with the means to fish them and sell them to the highest bidder. Yet, from the viewpoint of CST what makes marine life a common good is that it is destined for all and must not be used “with impunity (...), simply as one wishes, according to one’s own economic needs.” International laws regulating the use of “natural resources” clearly display the commercial interests that have gone into their wording. But as long as we allow financial interests to dominate our actions and view the forests, oceans, or lands as commodities to be exploited according to the “rules of the free market” we are far from establishing a just society and living lives of holiness.

WEIGHING IN

How can the Catholic Church weigh in when it comes to the socio-ecological biodiversity crisis? With its rich spiritual tradition, its multifaceted social tradition that has long incorporated the issue of care for creation, and its 1.3 billion members, the Catholic Church is uniquely positioned to help bring about a global societal transformation toward sustainability and to put a halt to the racing human-caused extinction and loss of biological diversity. Here, the notion of a radical ecological conversion can offer a particularly helpful tool to alter the foundations of individual behaviours together with facilitating the indispensable societal transitions and institutional transformation needed. Of course, in order to be a credible voice and a reliable partner to the many governmental and non-governmental stakeholders trying to address the crisis at hand, the Church itself must undergo such a conversion. It has already begun to do so, but unfortunately those within the Church trying to bring about change have also received a significant amount of push-back. Hence, the Church needs to continue this transformative process on itself (ad intra), while simultaneously making an impact on society (ad extra).

Some Moral, Philosophical, and Theological Considerations

A central challenge of the crisis is the persistence of the technocratic paradigm among those who perpetuate the current unsustainable state of affairs, but also those who want to overcome it. Much of the argument for reducing consumption, lowering the pressure on ecosystems, and protecting biodiversity is based on the fact that humans derive from nature numerous services that provide means for everyday life and ultimately secure human survival. Losing biodiversity will inevitably result in the loss of these ecosystem services and puts humanity at risk. The logic of the argument is persuasive, but it requires qualification lest it remain trapped within a technocratic worldview. Calculating the benefits creatures have to offer us to justify their protection is no less reductionist

than exploiting them for commercial gain. It ignores their suffering at our hands, the tragedy of the irreversible loss of individual lives and entire species. By focusing solely on ecosystem services as “capital assets” that should be protected to preserve ourselves, we shut out the wailing of God’s creatures and view them merely as a means to an end. Such a self-serving strategy is utterly misdirected. We are not to save them so we may have better lives, but because it is the right thing to do.

For it to gain moral traction, the call to conversion must balance social and ecological justice, rather than once again pitting environmental health against human interests. Humanity is part of the Earth’s biosphere and, thus, of the planet’s biological diversity. Moreover, humans benefit from the services ecosystems provide just as much as any other organism in those systems. By harming the biosphere humanity will harm itself and all its fellow creatures with whom it shares this common home, which alone should be reason enough to alter our behaviour. Yet, as the introductory quote from *Laudato Si’* implies, all creatures, human and nonhuman, possess intrinsic value that is utterly independent of how humans benefit from them. For Catholics and other theistic believers, this value originates in the world’s divine creation. But even non-believers can agree that the value of a life cannot be reduced to the quantifiable function it fulfils within an empirically describable system. Clearly, then, what is at stake in the socio-ecological biodiversity crisis is far more than just human well-being or the functioning of ecosystems. By losing biological diversity we irretrievably destroy innumerable beings that relate to the world and each other in a meaningful way. As Pope Francis insists, we have no right to cause such destruction.

Although based on CST, this integral argument for protecting biosphere integrity aligns very much with the wisdom traditions of many cultures, including those of the indigenous peoples, who have always lived in intimate relationship with and as an integral part of the natural world. What these traditions share is precisely the integral framework within which human activity is negotiated and understood. The understanding that traditional and indigenous knowledge is crucial for solving the

biodiversity crisis has reached the scientific community and received growing support. The Roman Catholic Church has the unique opportunity to translate this integral perspective into concepts appropriate for many cultures, including Western culture. In so doing, the Church could help industrialised societies to retrieve their very own traditional and indigenous knowledge and values long forgotten. By emphasising the intrinsic value of all life, the respect for the world of which humanity is part could be rediscovered by those who for too long have valued the life of nonhuman organisms entirely according to the benefits they obtain from these creatures.

One might object to the use of the ontological argument for the intrinsic value of all beings on the grounds that its philosophical foundation might seem too contrived, too culturally lopsided, and all in all too theological in scope in order to serve as the basis of an international policy agreement on the protection of biological diversity. However, there are at least two good reasons why this critique may not hold. First, the UN has become very receptive to positions that consider the philosophical and even religious views of people when it comes to working out strategies to battle the socio-ecological crisis. Second, there is ample precedence in the history of the UN for making ontological arguments the point of departure when developing binding international and transcultural conventions. One of the central concepts for UN policies is the notion of human rights, which according to the UN “are inherent to all human beings regardless of race, sex, nationality, ethnicity, language, religion, or any other [quantifiable] status.” Despite the ontological nature of the position, human rights have been the foundation of many international agreements. Clearly, policies can be phrased not only in terms of measurable categories, but also ontological ones. The idea is not to grant all creatures equal (human) rights, but to make non-quantifiable concepts the centre of international policy agreements and conservation efforts.

Some Priority Issues

With a crisis as advanced as the loss of biological diversity, many issues are pressing, and it is not easy to prioritise them. Conservationists and biologists have long discussed how to prioritise conservation strategies and how to distribute the limited resources between regions identified as particularly susceptible to the loss of biological diversity (e.g., biodiversity hotspots, endemic bird areas, ecoregions). Church actors like CAFOD would indeed be of great value when the time comes to consult on policy decision making regarding such issues, given their close relationship with communities in developing countries in some of the geographic regions most affected by biodiversity loss (e.g., Latin America and the Caribbean, Africa). Here, it would be important to align efforts according to the different impacts of the main drivers of extinction. While a lot of energy is rightfully spent on decarbonisation, the data clearly reveals land use change as the greater problem. That does not mean that less attention should be paid to climate change initiatives; rather, efforts to prevent excessive land use change need to be intensified. The same, of course, applies to other drivers, such as species overexploitation and the problem of invasive species.

Here, Catholic advocacy on biodiversity can contribute a unique perspective emerging from the Church's social teachings. Each of the main drivers of extinction has a social and an ecological dimension, and it is impossible to address one without the other. The international community is quite aware of the need to balance social and ecological justice, but often their decisions over-emphasise economic concerns, thus remaining deep within the technocratic paradigm. Trying to tackle such problems as land use change, species overexploitation, invasive species, pollution, or climate change without addressing the economic challenges associated with them would be naïve and ineffective. It would also be ethically problematic, because, from the perspective of CST, we must keep

the preferential option for the poor in mind. Like the use of technology, economic systems are only acceptable when based on sound ethics. Catholic actors trying to push for policies to get the drivers of extinction under control should therefore insist on an equitable distribution of wealth and power. Moreover, they should, informed by CST, insist that corporations commercially benefitting from exploiting the biosphere should no longer let local indigenous, traditional, rural or any other vulnerable community pay the price. The practice of internalising profits and externalising costs is diametrically opposed to fraternal love.

A topic of growing interest in recent research on issues related to protecting the biosphere, maintaining natural resources, and sustainable use of ecosystem services is human behaviour. Here, the focus lies on the perceptions underlying behaviour, how perceptions affect and shape behaviour, how actual behaviour might differ from perceptions, and how to negotiate and actualise behaviour changes. One of the problems at the intersection of perception, knowledge and behaviour is that quite often they do not align. When beliefs and actions are inconsistent, actors can experience cognitive dissonance, which they may change by altering their beliefs, the perception, or their actions. When it comes to the biodiversity crisis, many of us are not aware of the fact that our actions are incongruent with our beliefs. Most people do not want to harm other organisms or destroy ecosystems; they are simply not aware of the results of their actions and how those are not in line with whatever beliefs they hold. Feeling overwhelmed by the issues at hand and the dissonance between their beliefs and actions, many do not know what to do next to restore consonance. Christians experience this dissonance all the time, simply because they are called to act according to the Gospel yet fail to do so quite frequently. The Catholic Church has extensive experience with how to approach cognitive dissonance, and it is this wealth of knowledge,

largely reflected in CST, that the Church actors should focus on in all matters relating to the socio-ecological crisis. The same applies when it comes to the biodiversity crisis.

From an integral point of view, the root sources of today's socio-ecological crisis are systemic in kind, which is why at the societal level a radical ecological conversion must bring about a comprehensive structural change. This must involve a substantial transformation of the free-market economy that remains the hallmark of globalisation in favour of the common good. Catholic advocacy should continue to expose capitalism as a driving force behind sustaining social inequality and ecological degradation, no matter how unpopular such a critique might be even amongst Catholics themselves. The social teaching of the Church underscores the importance of making the virtue of solidarity a central norm of our global community and, consequently, also of our economic system. In that, CST is in complete agreement with the social doctrines of virtually all other faith traditions. Unless we alter the theoretical and ideological foundations of global commerce and trade, the suffering of God's creation will continue at our hands. We have no such right.

Key Political Opportunities

At the 15th meeting of the Conference of Parties in Kunming, China, the CBD will pass a post-2020 global biodiversity framework, the New Deal for Nature and People, to follow the Aichi Biodiversity Targets. For the past two years, this new step toward the UN "2050 Vision of Living in Harmony with Nature" has been prepared in a participatory process that has involved a variety of stakeholders, including nongovernmental groups. Because of the COVID-19 pandemic, COP 15 had to be postponed to the second quarter of 2021. Participating Parties and other stakeholder groups were invited to participate in the peer review of three preparatory documents: (1) the draft monitoring

framework for the Post-2020 Global Biodiversity Framework, (2) an information document on the links between the Sustainable Development Goals, and (3) the post-2020 global biodiversity framework and an information document on indicators for the post-2020 global biodiversity framework. Unfortunately, the deadline for submitting reviews has passed (25 July 2020). Nevertheless, the participation of Catholic advocates at COP 15 as an NGO observer would still be of value, as would contacting other already admitted NGOs (e.g., WWF) to discuss possible cooperative efforts.

At the request of the members of the Open-ended Working Group on the Post-2020 Biodiversity Framework, the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) provided an analysis of possible connections between the proposed goals, targets, and monitoring framework of the Post-2020 Global Biodiversity Framework (GBF) and the Sustainable Development Goals of the Agenda 2030. A variety of synergies between the goals of the two agendas were described in the information document that was open for peer review in preparation for the CBD COP 15. As mentioned above, while there are some trade-offs between the CBD and the SDGs, there are also extensive overlaps in interest and scope. The fact that the Post-2020 Biodiversity Framework is clearly negotiated with the SDGs in mind shows that the CBD is looking for coherent and integrated decision making that could minimise potential contradictions in the two agendas. Here, too, the Church and Church-related NGOs could weigh in. One opportunity to do so might be at the 5th Conference on the Least Developed Countries (LDCs) to be held 23-27 January 2022 at Doha, Qatar. The major objective of the conference is to build an ambitious new program for action for LDCs. It is primarily the LDCs that suffer from extreme biodiversity loss, given the far reaching ecological, social, and economic ramifications of the destruction of ecosystems in these countries. Another would be at the UN Oceans Conference, originally scheduled for 2020, now postponed

to a yet to be determined date due to the COVID-19 Pandemic. The conference will be co-hosted by Portugal and Kenya, and is focused on SDG 14, Life Below Water.

The Nairobi Work Program on Impacts, Vulnerability, and Adaptation to Climate Change (NWP) of the United Nations Framework Convention on Climate Change (UNFCCC) was “established (...) to facilitate and catalyse the development and dissemination of information and knowledge that would inform and support adaptation policies and practices, with a focus on developing countries.” On 8-9 July 2020, the NWP had its first expert group meeting on biodiversity, where knowledge gaps were identified and examined in order to better integrate biodiversity and ecosystems into plans for adaptation strategies with regard to the changing climate. Some of the themes that were discussed were the role of forest and grassland ecosystems in adaptation, design and implementation, and governance issues. The results of the meeting were meant to serve as an input to the 14th NWP Focal Point Forum held in conjunction with the 52nd meeting of the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) at COP 26, to be held under UK Presidency and in Partnership with Italy in Glasgow, 1-12 November 2021. The Conference of Parties 26 offers an important opportunity for Catholic stakeholders to engage in conversation and offer their unique perspective on the importance of protecting the biosphere.

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$$dt = \log(Nt/Nt-1),$$

where N are the two population measures.

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