Cardinal Stefan Wyszynski University in Warsaw
Institute of Philosophy
Center for Ecology and Ecophilosophy

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Why Are We Not on the Road to Save the Earth and Us? Indirect Drivers of the Anthropogenic Impacts on Environment

Dlaczego nie jesteśmy na drodze do uratowania Ziemi i nas samych? Pośrednie czynniki antropogenicznego wpływu na środowisko

Peter Sabo*[1], Ľudmila Sabová[2], Ingrid Turisová[1], Zlatica Plašienková[3]

[1] Matej Bel University in Banská Bystrica, Slovakia

[2] Independent Researcher, Slovakia

[3] Comenius University Bratislava, Slovakia

ORCID PS https://orcid.org/0000-0003-2290-1718; IT https://orcid.org/0000-0002-2753-5246; ZP https://orcid.org/0000-0003-3201-3722

• sabo.peterbb@gmail.com

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Abstract: The growth of anthropogenic impacts on environment rapidly acelerated since 1950s and led to overshooting of several planetary ecological thresholds, decreasing the Earth´s ability to support our civilization. Even the concept of sustainability did not lead to recognition of necessary limits to this growth. These limits define the framework of our study on the roots of the current environmental crisis. Numerous studies have been devoted to environmental degradation, but analyses of its indirect driving forces are often fragmentary and confusing. We have attempted to provide a systemic assessment of three groups of indirect drivers by reflecting new physical ones and adding the paradigmatic drivers – such as the mechanical heritage and low reflection of life´s awesome complexity. A paradigm shift is required, as the current paradigm is incompatible with the reality of the Earth´s life support systems erosion. We also strived to contribute to much debated value-based category analysis. This underlines complexity of the driving forces of the crisis. Moreover, some strange theories of how to come out of the crisis were mentioned. We stress the opportunity for Christians to put into practice the biblical messages to become caring stewards of nature in the God´s image.

Keywords: planetary boundaries, environmental crisis, physical drivers, paradigmatic drivers, value-based drivers, Christianity and ecology

Streszczenie: W latach pięćdziesiątych XX wieku nastąpił szybki wzrost wpływu antropogenicznego na środowisko, co spowodowało przekroczenie kilku „czerwonych linii" w obszarze ekologii, co następnie podważyło zdolność planety do podtrzymywania naszej cywilizacji. Nawet wprowadzenie koncepcji zrównoważonego rozwoju nie doprowadziło do przyjęcia wystarczających ograniczeń wpływu człowieka na środowisko. Celem niniejszych badań jest określenie koniecznych granic rozwoju cywilizacji, których przekroczenie w przeszłości doprowadziło do obecnego kryzysu ekologicznego. Dotychczas poświęcono wiele badań problemom zwiazanym z degradacją środowiska, jednak wyniki analiz ich pośrednich przyczyn są często fragmentaryczne i mylące. Niniejszy artykuł podejmuje próbę dokonania systemowej oceny trzech grup czynników pośrednich, poprzez podkreślenie nowych czynników natury fizycznej oraz dodanie czynników paradygmatycznych – takich jak dziedzictwo paradygmatu mechanistycznego oraz odzwierciedlenie ogromnej złożoności życia. Konieczna jest zmiana paradygmatu, gdyż obecny jest niezgodny z faktyczną erozją systemów podtrzymywania życia na Ziemi. Artykuł stara się również wnieść wkład w szeroko dyskutowaną analizę kategorii opartych na wartościach.

Podkreśla to złożoność sił napędowych kryzysu. Wspomniano również o niektórych absurdalnych teoriach dotyczących wyjścia z kryzysu. Podkreślamy, że chrześcijanie mają możliwość wprowadzenia w życie biblijnych przesłań, aby stać się troskliwymi zarządcami przyrody na obraz Boga.

Słowa kluczowe: granice planetarne, kryzys środowiskowy, czynniki fizyczne, czynniki paradygmatyczne, czynniki aksjologiczne, chrześcijaństwo i ekologia

> "Here we see how environmental deterioration and human and ethical degradation are closely linked."
> *Laudato si'* (no. 56)

Introduction

The human history illustrates the growth of our impacts on environment, which exploded in the period of Great Acceleration (dating from 1950) and nowadays have overshot the planetary ecological limits. This is documented by a number of studies, e.g. those by Meadows et al. (1972), Ehrlich and Ehrlich (1992), Vitousek et al. (1997), Steffen et al. (2004, 2015a), Ellis et al. (2010), Krausmann et el. (2013), by reports from UNEP, FAO, IPCC, IPBES, IUCN, WWF, EEA and others.

To stop environmental degradation, it is necessary to address a complex network of its direct and indirect driving forces (Brondízio et al. 2019; Díaz et al. 2019). Our methodology is inspired by the classic IPAT equation of environmental impact (Holdren & Ehrlich 1974) and more systemic view presented by the Millenium Ecosystems Assessment (Reid et al. 2005). Also, other relevant scientific studies and reports of environmental organizations, mainly related to global megatrends (EEA 2015, 2019; UNEP 2019; Považan & Blaško 2023) were analysed. To reflect a high complexity of indirect drivers we consistently applied a systems view of life (Capra & Luisi 2019) and have slightly enhanced the principles, which should be included in the formula for assessment of environmental impact. Finally, the most important drivers were systematically classified and characterized. The network, presented in part 3, reflects also our own research in the fields of biodiversity loss (Sabo et al. 2011), sustainability (Sabo & Cochová 2012; Sabo 2014) and ecological synthesis (Sabo et al. 2020).

Reflecting on the widespread disturbance of living systems and societies, it appears to us that the rise of alienation from God often goes hand in hand with the rise of alienation from people and nature.

1. Brief History of Growing Human Impacts on Environment

In order to warn against the romantic idealisation of the past and to refute blaming anthropocentrism and Christianity for the current crisis, which is relatively widespread among conservationists and philosophers, we also briefly outline the main milestones of growing human impacts on environment.

1.1. From hunter-gatherers to the first Industrial Revolution

Environmental impacts of hunter-gatherers were limited by a small size of their population, very short life expectancy, low consumption and simple hunting practices. Despite this, in the period of 50 000 – 10 000 years ago, hunters contributed to the extinction of 90 genera of the ancient megafauna in five continents (Koch & Barnosky 2006, 216).

The environmental impacts of early agriculturalists included regionally widespread deforestation aimed at acquiring pastures and arable land, huge soil erosion, salinization due to intensive irrigation of crops, degradation of grasslands by large herds of cattle and loss of native animals hunted to gain meat and to decrease their competition with cattle (Steffen et al. 2004).

Environmental impacts of ancient and medieval mining included pollution of air, water and massive displacement of extracted materials. Large waste heaps are still a source of heavy metals, contaminating waters (Steffen et al. 2004). As melting of ores required high amounts of fuel, landscape around mining towns in medieval Europe suffered from large deforestation (Midriak 2005).

The first Industrial Revolution leading to higher impacts (starting in the 18th century), as mechanized production was supported by intensive burning of fossil fuels (esp. coal), which caused high pollution of air, water and soil. Migration of people from rural areas to towns led to increased consumption of materials and energy and production of more waste.

1.2. Great acceleration of prosperity and environmental damage

The International Geosphere-Biosphere Programme (IGBP) pointed out that the global socio-economical development has sharply accelerated in the period called the *Great Acceleration* (Steffen et al. 2015b; EEA 2019). Since 1950 the size of human population has increased by 220%, the proportion of town inhabitants has risen from 30% to 57% (PRB 2023) and global economy has risen 15-fold. The IGBP scientists quantified twelve global socio-economic trends, amplified in this period – growth of human population, urbanization, rise of the GDP, car numbers, energy and water consumption, paper production, international tourism and others. (Exception is the conversion of natural land to agriculture, which was more rapid between 1870 – 1960, fig. 1.)

The price that we pay for this increase of prosperity is a dramatic loss and degradation of natural ecosystems and other life suport systems of the Earth. The IGBP team selected twelve negative environmental trends: the growth of the greenhouse gases concentration in the atmosphere, rise of the Earth surface temperature, ocean acidification, marine fish capture, eutrophication of coastal zones, tropical forests loss, land transformation (Fig. 1) and others. Although inclusion of some trends may be questioned, they all together demonstrate the deterioration of environment due to growing pressures of the crucial physical drivers on environment: population growth and consumption.

2. Sustainable Development, Anthropocene, Planetary boundaries

The rise of modern environmental movement can be traced back to the publication *Silent Spring* by Rachel Carson (1962), the scientist who warned against the high risks of the pesticides assault on environment and human health. In 1972 the report *The Limits to Growth* was published, presenting the results of computer simulations of five of the global trends: growth of the human population, food production, industry development, use of natural resources and pollution (Meadows et al. 1972). This report issued a warning that the limits to growth on the Earth will be reached during the next hundred years.

2.1. The concept of sustainable development

In 1987 the World Commission for Environment assessed global development as unsustainable and proposed the compromise concept of sustainable development (SD), striving to integrate environmental, economic and social pillars of human life (UN 1987). This was approved as the Agenda 21 at the UN Conference on Environment and Development in Rio de Janeiro in 1992. In 2015, the UN approved *2030 Agenda for Sustainable Development*, which defines 17 strategic goals and 169 measures comprising fight against poverty and inequalities, improvement of human health and well-being, justice, access to education and decent work, protection of water, air, climate, land and ecosystems (UN 2015).

SD principles have been pursued in many development strategies, action plans and projects. They led to the development of new materials and energy saving

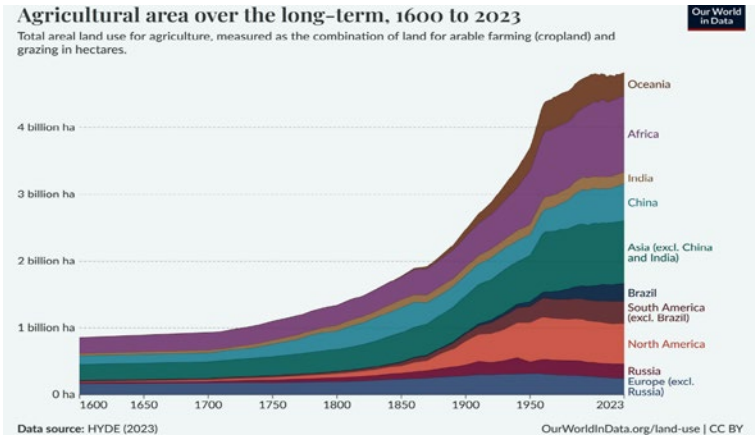

Figure 1. Agricultural area over the long-term, 1600 to 2016
Authors: Hannah Ritchie & Max Roser, 2019. Our World in Data, Creative Commons BY 4.0., https://ourworldindata.org/land-use

technologies and to a robust environmental legislation. Some of the achievements are remarkable, e.g. rise of the number and size of protected areas, covering in 2020 already 16.64% of the surface of continents and 7.74% of the oceans (UNEP & WCMC 2021).

However, the *driving forces* of destruction were not halted. The reasons include the differing views of the SD concept (Davies 2013, 113), but mainly the shortsighted criteria of societal progress based on perpetual economic growth, the idea irrational in any finite system, including the Earth.

2.2. The Age of Anthropocene, overshot planetary boundaries and SD revision

The scientists uncovered dependency of human society on *natural capital* providing to us numerous ecosystem services for people. Some of the authors emphasize that we already live in the age of Anthropocene, characterized by enormous anthropogenic pressures on environment (Crutzen & Stoermer 2000; Zalasiewicz et al. 2010), leading to widespread changes of the Earth surface.

Rockström et al. (2009) and Steffen et al. (2015a) defined a new approach to sustainability: a life within ecological limits of the Earth. Their concept of *planetary boundaries* is based on identifying the boundaries of a zone of safety of human activities, a large zone of risk, and nine main critical processes, which disturb and destabilize the life support systems.

The unprecedented problem is that *six of the nine main degradation processes have overshot their planetary (ecological) boundaries* – the sustainability thresholds (Richardson et al. 2023). These include 1. loss of biosphere integrity and biodiversity, e.g. 1 million threatened species (Brondízio et al. 2019); 2. evolving climate change; 3. large disturbance of biogeochemical flows, manifested by the changes of nitrogen and phosphorus cycles; 4. high pollution of environment by novel entities – synthetic chemicals, nanomaterials, microplastics, GMOs, a massive flood of antibiotic residues, etc.; 5. widespread land use change, including huge deforestation in the tropics; 6. growing extraction and use of surface and underground water resources leading to decrease of soil moisture and even to aridization of large areas.

These processes represent extremely *high anthropogenic entropization of ecosystems and land,* which destabilizes the Earth system (Muys 2013; Sabo et al. 2020). Their synergy may lead to dramatic irreversible changes of the Earth system (Rockström et al. 2009). We face a tremendous challenge to stop the biosphere degradation and, at

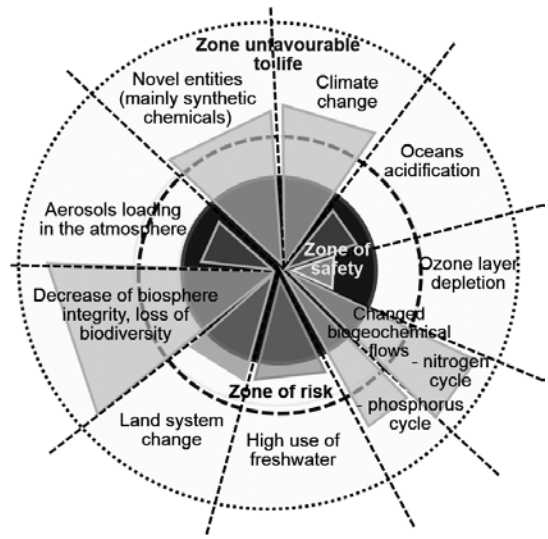

Fig. 2. The concept of the planetary ecological boundaries
According to: Steffen et al., 2015a; Richardson et al., 2023. Adapted.

the same time, to provide enough resources for dignified life of almost 10 billion people in 2050 (UNEP 2019). To cope with it, we must search for the roots of the crisis (Díaz et al. 2019; Sabo et al. 2020; Sadowski 2023).

3. Main Physical, Paradigmatic and Value-based Driving Forces

There are numerous and complex driving forces of environmental deterioration. The *direct drivers* directly disturb land and ecosystems, while the *indirect ones* significantly influence the direct drivers (Reid et al. 2005). The direct drivers include: 1. land and sea use changes (including deforestation) leading to liquidation, fragmentation and degradation of habitats; 2. pollution of environment leading to its eutrophication, acidification, alkalinization or contamination; 3. overexploitation of natural resources – e.g., excessive extraction of water or overfishing impacting marine ecosystems; 4. climate change, increasing drought and desertification and accompanied by ocean acidification; 5. spread of invasive species, of new weeds, pests and pathogens.

As respected environmental reports (e.g. UNEP 2019, EEA 2019; Brondízio et al. 2019) and scientific studies (e.g. Kissinger et al. 2012; Burkmar & Bell 2015; Hald-Mortensen 2023) already deal with these groups of drivers in detail, we focus here futher on the indirect drivers – the roots of the crisis. Without addressing them it is impossible "to prevent further deterioration of the fabric of life on Earth" (Diaz et al. 2019).

3.1. Introduction to indirect drivers of environmental degradation

The classic equation of environmental impact I = P × A × T was developed in 1970s during a discussion on the roles of human population size (P), consumption (A – affluence) and technology (T, expressed by pollution / environmental degradation per unit of production, Holdren & Ehrlich 1974). This *"IPAT equation"* draws attention to three basic groups of physical drivers.

However, this is too simplified, e.g. A originally meant per capita use of energy required to obtain resources (Ehrlich & Ehrlich 1992, 8). It does not include the land use required to provide natural resources and absorb pollution – the basis of the concept of ecological footprint (GFN 2023). Furthermore, T hides that environmental damage depends not only on resource effectiveness of production, but also on governance and land management, crucial in agriculture, forestry and territorial planning.

Millenium Ecosystem Assessment (Reid et al. 2005) added other drivers, i.e.,

socio-political, which influence decision making and the cultural ones based on values and norms shared by a community, as these influence consumption behaviour. Nowadays studies on drivers include numerous *demographic, socio-economic, political, institutional and value-based processes* (Díaz et el. 2019; Považan & Blaško 2023). The problem is that many analyses are either fragmentary, concentrating on one selected process (e.g. deforestation, Kissinger et al. 2012) or are mixing up erroneously diverse groups of direct and indirect drivers (e.g. Maurya et al. 2020; Hald-Mortensen 2023). Also, deeper analyses of value-based drivers, such as the one provided by Sadowski (2023), are rare.

It appears that a realistic IPAT equation should be more complex, but it will not be discussed here. It seems that *listing a few principles may be useful*, also for systemic classification of the drivers: 1. As there are big diferences between various layers of a society, impact I should be quantified for each of them separately. 2. Land changes are huge and overshot its planetary boundary, thus consumption A should include land consumption (apart from energy and materials). 3. Technology T should take into account also land degradation (e.g., land use effectiveness is approximately by two orders higher in an atomic power plant than in a photovoltaic one). 4. The fact that consumption A is to a large extent the function of the set of values shared by community should be reflected. 5. Technology effectiveness T is influenced also by governance (a good governance and public participation may help avoid bad decisions). 6. T is also influenced by ecological territorial planning, it is crucial to preserve natural capital in agriculture, forestry, national parks, but also when planning settlements, roads, etc.

3.2. Main physical driving forces

Most authors agree on basic drivers: human population size, urbanization, consumption and the role of technology (Reid et al. 2005; Díaz et al. 2019; Považan & Blaško 2023). However, these are sometimes mixed with other groups, such as biodiversity loss, pollution, climate change or water extraction (Kissinger et al. 2012; Maury et al. 2020). We tried to provide a more *systematic set of indirect physical drivers.*

3.2.1. Demographic drivers (P)

Growth of human population: In the year 2023 human population size reached 8.01 billion (84% in less developed countries) and prognosis to the year 2050 is 9.8 billion; the average global fertility rate dropped to 2.2, in Europe to 1.4 (deep below the natural reproduction rate), but in the least developed countries it is 4.1 (PRB 2023). This growth increases demand for resources – mainly food, clothes, shelter, transport.

Rapid urbanization: While in 1975, 1/3 of people lived in towns, in 2023 it was 57%, 80% in more developed countries, 75% in Europe (PRB 2023). Urban agglomerations provide better education, innovations and higher economic effectiveness. However, a town inhabitant, on average, consumes more materials and energy than a rural one. Large urban areas and transport infrastructure also contribute to habitat fragmentation, soil sealing and summer overheating of city centers.

3.2.2. Socio-economic drivers (A)

Growth of consumption: Rise of human population, combined with unprecedented economic growth led to a steep rise of material and energy consumption. Since 1970, the consumption of fossil fuels has grown by 164%, that of metal ores by 289%, of nonmetallic minerals by 434% and biomass consumption by 111% (Fig. 3).

Growth of land consumption: Large consumption means also society's high requirements on land, measured by the ecological footprint. In 2019, its global average was 2.6 global hectares (gha) per person, which highly overshot the average biocapacity (available biological resources) 1.6 gha/ person – by 62.5% (GFN 2023). The high concentration of people in towns saves land, but these savings are outweighted by other land

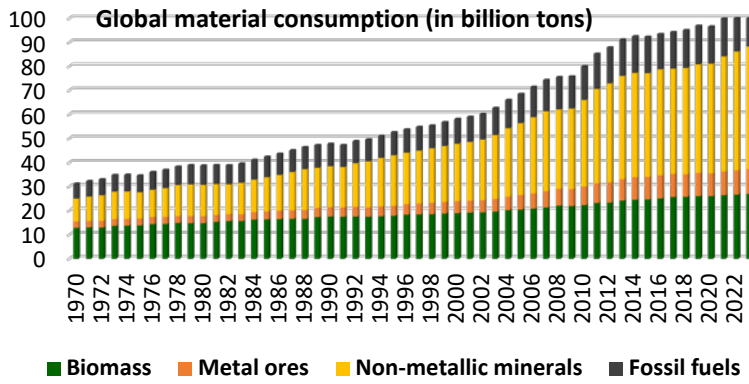

Figure 3. Rapid growth of material consumption
According to: WU Vienna, 2023: Material flows by material group, 1970-2024. Vienna University of Economics and Business. https://www.materialflows.net/visualisation-centre. Source of data: UNEP IRP, 2024: Global Material Flows Database, International Resource Panel, Paris, https://www.resourcepanel.org/global-material-flows-database.

use changes, mainly by conversion of natural ecosystems to pastures, arable land, plantations, industrial parks, etc.

Poverty and hunger: Despite global economy rise and decreasing share of the undernourished people, their numbers are still high: between 691 – 783 million in 2022 (FAO 2023). Moreover, rapid urban sprawl combined with poverty increases number of people living in slums or slum-like conditions. In 2020, it was 1.1 billion (mainly in Africa and Asia), while prognosis towards 2050 is 2 billion (UN 2023). People striving daily for food, water and fuel have no capacity to care for land.

High economic asymmetry: The property and income asymmetry is increasing dramatically: according to OXFAM International (2020) in 2020, the 2 153 billionaries had more wealth than 4.6 billion of poor people. Fukuyama (2023) explains this by the turn of economic liberalism into neoliberalism, where institutions protect the economic and ruling elites and promote enormous growth of inequality. Moreover, the lifestyle of billionaires mostly leads to a very high consumption of resources.

3.2.3. Technological drivers (T)

New technologies increase effectivenes: New technologies save material and energy and decrease pollution per unit of production, thus also the size of the variable T in the IPAT equation. The corporations favour problematic *"end of pipe"* solutions (which just transfer pollution from one environmental component to another). Environmentally friendly and even more economically efficient are cleaner *"process integrated"* technologies (Jiawei 2021), while modern IT technologies help us to manage better the resources, design urban territorial plans, zonation of national parks, etc.

Efficient technologies bring about rapid conversion of land: Their fast development results in very high flows of matter, energy and information, increasing exploitation of resources and widespread land transformation including massive deforestation in the tropics. While in the year 1700, mankind significantly changed only 5% of the Earth's ice-free land, in 2000 it was 55%, transformed mostly into agricultural land, settlements and transport networks (Ellis et al. 2010).

Rapid technological development has brought existential risks: This concerns e.g., novel entities – mainly synthetic chemicals (Persson et al. 2022) and synthetic biological agents, but also risky large-scale manipulation of climate by geoengineering. Highly dangerous are autonomous weapons and the expected arrival of artificial superintelligence (super AI), threatening that our survival and future may depend on its decisions (Sparrow 2022). It is time to recall the old

wisdom: not only fire but also each developed technology may be a good servant that may become a bad master. Therefore, a wise society should have the development and use of technologies under control.

3.3. Main governance related and paradigmatic drivers (influencing A and T)

Another class of indirect drivers relates to science, governance and to often prevailing old mechanical paradigm. Science has become a basic source of knowledge, enabling better health care, education, prosperity, etc. It strongly shapes human perception of the world (Capra & Louisi 2019). *The scientific paradigm* embraces a widely accepted set of scientific axioms, methodologies, theories and policies, which provide the basic frame for defining problems and search for solutions (Kuhn 1962, in Capra & Luisi 2019).

3.3.1. Drivers related to science, governance and institutions

Two sides of modern science: Humanity is always in danger, when scientific knowledge is neglected, or its interpretation is deformed. Science, when practiced honestly, could help find the way out of the crisis. On the other hand, there is a pressure upon the scientists by politicians and business groups to support short-term promises of prosperity to their electorate or shareholders. The involvement of scientists in these shortsighted profits can lead to further increase of natural resources depletion.

Inadequate or insufficient institutions: Despite mighty science, robust environmental legislation, rise of protected areas and numerous sustainability action plans, county, national and international environmental institutions are by far weaker than the economic ones, ruthlessly exploiting natural and social resources. The international environmental conventions and UN special organizations (UNEP, FAO, IPCC, IPBES, UNESCO) do not have the authority to do much about it.

Loss of confidence in governance and institutions: The vast social, economic and environmental problems are shaking societies throughout the world, eroding the trust of people to previously shared societal goals and norms (Sabo et al. 2011; Sokolíčková 2012). During and after the Covid-19 pandemics, a huge wave of mistrust to authorities, even to physicians and scientists, swept also across Europe. This loss of a common glue threatens democracy, deepens conflicts between various social, ethnic and sexual groups firmly identified just with their own societal concepts (Fukuyama 2022).

3.3.2. Paradigmatic drivers

The heritage of mechanical paradigm: Great scientific discoveries in the 16th and 17th century shook the medieval worldview. The great scientists also built-up the mechanical reductionist paradigm, that stands also at the roots of our crisis (Capra 1984). Galileo Galilei called for research based only on precise scientific equipment and mathematics, neglecting non-measurable qualities of nature; Francis Bacon called for ruthless conquest of nature as the best road to happiness and prosperity. René Descartes replaced the organic view of the world by the mechanic one: "I have described the earth and the whole visible universe in the manner of a machine" (Clarke 1993, 90). This has got a mathematical expression in Newton's physics as a new theory of the order of the world (Capra & Luisi 2019).

This heritage led to breaking the ethical barriers protecting people and nature and promoted a ruthless *lordly anthropocentrism.* The land was reduced to a lifeless factory to be forced to provide humans with endless supply of goods. It has crept also into the concept of sustainable development (in the 8th strategic goal, UN 2015), degrading the ecological pillar, the fundament of life on the Earth, only to a partner of economic and social development – actually subordinated to the economic growth.

Sadowski (2023, 2-3) has added to this group of paradigmatic drivers also *"Mathematization of the world."* At first glance, it may seem strange as mathematics belongs to the great tools, with which Creator

composed His monumental symphony of life, with fine tuned variables and systems of the universe and Earth, to be fit for life. However, mathematics, a very useful servant – e.g., improving diagnostics of diseases and monitoring of environment – has become a very bad master, as soon as it was positioned as the supreme method of knowing the world. As a consequence, the perception of quality in the world was replaced by quantification of nature (Sadowski 2023, 3).

Underestimation of the high complexity of life: Basic attributes of living nature include its awesomely high biological and ecological complexity. The numerous and diverse elements of all the living systems and their interactions illustrate God's enormous love, wisdom and creativity. Living systems are organized into marvellous networks, hierarchies and symphonies, characterized by both spontaneity (freedom) and order, high dynamics, non-linear behaviour and emergent properties (new ones emerging at each level of organizational hierarchy, Capra & Luisi 2019; Sabo et al. 2020).

The example of ignoring life's complexity are endeavours of many politicians, climate activists, corporations and still some scientists to treat climate change as a separate proces (IPCC 2023), neglecting other processes, which also overshot planetary boundaries and influence climate, such as the decrease of biosphere integrity and changed water cycle. This is embodied in *the myth of the carbon neutrality of biomass*, which has led to massive burning of wooden pellets in biomass power plants, mainly in Europe, USA, Japan. This myth ignores that no forest grows as quickly as its wood is burned in a power plant. Contrary to reality, emissions from such a burning are irresponsibly undervalued (Ahamer 2022). What is more, a lot of wood is imported to the UK and EU countries from North America (Voegele 2019), adding emissions of CO_2 due to transport. The same is valid for biofuels, especially those based on palm oil from plantations, which have replaced vast areas of tropical forests.

Till 2050, this focus on bioenergy could increase the human appropriation of the Earth primary net production to dramatic 44% (Krausmann et al. 2013). This will not help climate, on the contrary, it will further decrease natural capital and its capacity to sustain our civilization. Together with Capra & Luisi (2019) and Sadowski (2023) we believe that less mechanical, organic and contextual system thinking, is just now critical for survival and prosperity of our civilization.

3.4. Several value-based drivers (influencing A and T)

Reading the Holy Scripture, we can see that the boundary between good and bad goes through the heart of each of us, regardless our declared affiliations. However, after expelling God from modern society, many people face isolation from natural relations to humans and land. The deletion of the entire traditional value base may lead to a loss of meaning of life (Sokolíčková 2012), which for many people becomes reduced only to sensual and material assets. This process transforms society and land from a loved home to an alienated territory, which promotes ruthless competition for resources instead of cooperation (Skolimowski 1992).

3.4.1. Consumption culture and cultivation of vices

Mass consumption culture: The throne belonging traditionally to God, did not stay empty, but was rapidly filled by very diverse materialistic idols. The removal of barriers, limits and taboos promoted indulgence and consumerism – the culture of mass consumption based on wasteful flood of needless and short-lived products. Erazim Kohák (2006, 79) defines consumerism as a wrong idea "that the meaning of life is to consume… – that the meaning of society is to enable perpetual escalation of consumption and that this escalation will resolve all problems…" This leads inevitably to accelerating depletion of natural capital and erodes its capacity to support civilization.

Cultivation of vices, a blind path to happiness: The pressure of the globalized economy in combination with promotion of corporate values, trampling on the Ten Commandments moral, leads to egoism and greed, and to atomised and destabilized society: "If human vices such as greed and envy are systematically cultivated, the inevitable result is nothing less than a collapse of intelligence. A man driven by greed or envy loses the power of seeing things as they really are, of seeing things in their roundness and wholeness, and his very successes become failures" (Schumacher 1974, 29). Fromm (1990) points out that the rise of consumption and endless accumulation of property could not bring promised happiness for everybody due to a simple reason: "The affirmation of one's own life, happiness, growth and freedom, is rooted in one's capacity to love" (Fromm 1956, 60).

Inner pollution by information waste: Pollution does not hamper only the environment. Our minds are flooded by a mass of useless information produced by mass-media, also by mass entertainment, prevailingly shallow, vulgar, violent and oversexualized. Social media add a lot to this pollution, spreading waves of hoaxes, untrue statements, which a common reader has no means to verify. Also, there is ugliness of a part of the modern art and architecture not aspiring to beauty anymore (Scruton 2023). The polluted and overburdened human mind, when facing the news on the hard reality of the state of the Earth' ecosystems often screens out or rejects it. Many Christians are not an exception, forgetting that they can turn to God for the support of His love and wisdom when looking for a way out.

3.4.2. Loss of authentic experience and crisis of perception

Extinction of authentic experience: Life in large cities, loss of jobs with direct contact to rural landscape, e.g. foresters, farmers, fishermen, loss of traditional skills required for life *with nature,* theme-park type entertainment attractions instead of walks or educational stays in nature, all of this alienates people from wildlife (Soga & Gaston 2016). Moreover, prolonged exposure to social media and to virtual reality significantly contributes to the loss of contact with nature. This disconnection often leads to impoverished human life and poorer health. And sometimes it ends up even in biophobia – fear of wild nature, forests, rivers, animals.

Distorted perception of reality: This extinction of direct experience with nature creates a vicious circle, in which the crisis revolves as an extroversy of an injured human soul: "The Earth's cry for rescue from the punishing weight of the industrial system we have created is our own cry for a scale and quality of life that will free each of us to become the complete person we were born to be" (Roszak 1992, 14).

3.4.3. Cutting off the cultural roots and radical theories

Refusal of tradition: For some theorists the prime suspect in the search of culprit of the crisis is the anthropocentrism rooted in the Judeo-Christian religion. Lynn White (1967), Arnold Toynbee and others blame Christianity for alienation of man from nature by replacing pagan animism and by promoting science and technology which led to overexploitation of nature (Sadowski 2023, 2). The critiques of Christianity often cite the verse "Be fruitful and increase in number; fill the earth and subdue it..." (Genesis 1:28), ignoring the wider context and other important messages, especially "The Lord God took the man and put him in the Garden of Eden to till it and take care of it." (Genesis 2:15). *The elevation of man by God is a mandate to care, not to destroy.*

Blaming Christianity for the current crisis is not justified even from the historical point of view. We have outlined that a tiny population of primeval pagan hunters contributed to extinction of 90 genera of large animals. Degradation of environment may have contributed to collapses of some great ancient pre-Christian societies (Tainter 2009). And the impacts of the polytheistic Ancient

Greece and Rome on environment are still evident in large areas of the Mediterranean, while the rapid rise of consumption in developed countries since 1950 was accompanied by retreat of Christianity from the public life.

This refusal of Judeo-Christian tradition has two grave consequences: At first, romantic affinity to paganism and some polytheistic religions often leads to *biocentrism* (Naess 1990; Seed et al. 1993). Biocentrism rightly emphasizes the *intrinsic value* of each living organism and casts doubt on human superiority (Kohák 2006, 93). However, as there is no other organism on Earth with consciousness who could resume responsibility for the land, sea and all the living creatures other that the human being, biocentrism cannot provide a solution.

Another phenomenon is the *rise of radical theories*, which reduce the meaning of human life only to biology. For example, a popular Czech environmental philosopher claims that his evolutionary ontology "allows to define man in a factual way, without useless value colour," and that man "cannot be a top and meaning of the natural evolution of the biosphere" (Šmajs 1996, 38 and 113). Such refusal of the entire cultural and spiritual heritage and attempts to build a completely new value system solely on biological ground carries with it a high risk of dehumanization.

Some people *romantically idealize the past*, even the era of hunter-gatherers as an example of sustainable society. However, this ignores harsh daily struggle of primeval people for survival and also extremely low Earth carrying capacity to support this mode of life. According to newer assessment the size of their population did never exceed 17 million people (Zhu et al. 2021, 4). This is not a model, which may be shared by 8 billions.

Conclusions

The current environmental crisis is multidimensional. Alongside the mitigation of direct human impacts, we must consider the complexity of its numerous indirect driving forces and of their interactions. Apart from dealing with more visible physical drivers, we should recognize also the governance related, paradigmatic and value-based ones. We do need a paradigm shift, but we should be careful not to follow the blind routes. We have to remind ourselves: "The Earth is God's icon, the window to absolute, the book written by God" (Vácha 2016, 52).

We have tried above to provide some arguments for the thesis that alienation from God goes hand in hand with alienation from nature and people. Christians may have found explanation of this crucial value-based driver of the current crisis in the book of Genesis, verse 1:27: "So God created man in his own image, in the image of God he created him…" We have been gifted by enormous talents and creativity "in the image of God". *Throwing away, in our pride, the God's image, we have often misused the awesome gifts,* contributing gradually to the degradation of land, sea and biosphere, society and culture.

As Pope Francis stated in his encyclical letter *Laudato si´* (2015, no. 66): "The harmony between the Creator, humanity and creation as a whole was disrupted by our presuming to take the place of God and refusing to acknowledge our creaturely limitations. This in turn distorted our mandate to 'have dominion' over the earth (cf. Gen 1:28), to 'till it and keep it' (Gen 2:15)." He emphasized that the answer to the crisis requires integral solutions.

Healing the environment, society and our souls are inseparable tasks. "Human stewardship of land should be carried in the image of God's dominion..." (Pardee 2013, 127). The awe, respect and care for all God's creation and awareness of our irreplaceable responsibility of beings with awesome gifts and capabilities is the only way, from which the right solutions may be born.

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