

Review

Learning from the Past: Lessons from the First United Nations Report on Problems of the Human-Environment

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Abstract: The 1969 UN Report “Problems of the Human Environment” was a seminal work that first highlighted environmental problems at a global scale. This report underpinned a series of subsequent international summits and conventions of the 1992 Rio Earth Summit and the subsequent three global conventions on Biodiversity, Climate Change and Desertification. We assessed the report half a century after its publication to track changes in vocabulary and highlight critical lessons that could have been learned. The assessment contains several strengths and weaknesses that are pertinent to modern global-scale analyses. Many issues of that day have declined in importance or been superseded, and several major environmental problems (including climate change and plastic pollution) were not foreseen. Most of the report’s predictions proved to be much more conservative than proved by reality (a criticism that has also been levelled at contemporary IPCC reports). The report, however, did forewarn of global pandemics and stimulated thinking on a global scale that led to identification of the current climate crisis.

Keywords: sustainable development; UN report; conventions; institutions; environmental challenges



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1. Introduction—Context of the 1969 Report

After World War II, an economic race commenced among both war-affected and non-affected countries (e.g., a rapid growth in the US between 1950 and 1973: [1]). Similarly, the Western European countries experienced an economic ‘golden age’ during the 1950s–60s [2]. At the time, there was no reason to believe growth would be short-lived, nor any argument for their deceleration, or cessation. It was a time of prosperity and pop culture [3]. Voracious demands of a growing population (2% per annum in the late 1960s: [4]), seeking to reconstruct or modernise ruined European infrastructure and create a new, modern lifestyle left no option but to invest, create, generate, and manufacture more and more (e.g., UK: [5]).

The term “Frontier economics” suggested by Kenneth Boulding which “treats nature as an infinite supply of physical resources (raw materials, energy, water, soil, and air) to be used for human benefit . . . ” ([6], p. 8) prevailed in industrial countries until the late 1960s. Oil and gas as industrial-scale energy sources became alternatives to coal [7] and propelled the economic engine for many nations. The consumption of coal as a fuel decreased from 62% in 1940 to 23% in 1970, while oil and natural gas increased from 26% to almost 70% [7], substituting one polluter (coal) by another (oil).

During this period of economic prosperity of the 1960s [1] the environmental crisis started looming on the horizon [4] and new environmental movements were formed in some countries (e.g., USA: [8]; Germany: [9]). Amid the economic gains, the environment was seen as a victim of human dominance on a scale had not been seen before. Since the early 1960s, concepts of environment and pollution became part of public awareness [10]. Moreover, increasing population growth and the need for more food and energy sources become contentious issues [10]. Media publicity (Films, TV programmes) exposed ecological disasters [4,5]. In the US, dam building in wilderness areas during the 1950s and

the publication of “Silent Spring” in 1962 enticed the formation of the environmental movement [8].

In Germany, environmental policy was developed into an independent policy area based on a comprehensive concept of environmental protection in 1969 [9] and likewise, the environment became a separate policy area in Sweden [11]. Other countries started to establish Departments of Environment in the 1970s (e.g., 2010; Canada in 1971: [12]; Iran in 1972: [13]). The international environmental organisation ‘Greenpeace’ was founded in Vancouver, Canada in 1971 [3]. Words such as ecology and pollution became commonplace [5].

These growing environmental concerns were noted by the United Nations General Assembly on 3 December 1968. Paragraphs 2 and 3 of resolution 2398 (XXIII) called for action on the problems of the human environment. It was decided to convene a United Nations Conference on the Human Environment in 1972 and the Secretary-General was requested to prepare a report for convening that Conference [14]. Consequently a 1969 report was compiled on the problems of the human environment. The report reflected the public mood and political and economic circumstances at a time when industries were enjoying rising profits and western societies were experiencing rapid development.

During the twenty-third session of the UN General Assembly, “it was emphasized that for the first time in the history of mankind, there is arising a crisis of world-wide proportions involving developed and developing countries alike, . . . the crisis of the human environment” ([15], p. 4). Therefore, in response to paragraphs 2 and 3 of General Assembly resolution 2398 (XXIII), the report was prepared, probably as the first official UN global report.

The report comprises three sections: The main problems (Section 1), Nature, scope, and progress of present work (Section 2), and United Nations Conference on the Human Environment (Section 3). Here, we focus on Section 1, which contains many figures and makes several predictions that can be compared with subsequent events. The other two parts are related only to preparing the proposed Conference and establishing institutions. The document, prepared by unidentified consultants, sets out enduring environmental problems as perceived at that time.

After half a century, we review this preparatory report to explore its scientific claims and predictions and to assess the relevance of these lessons of hindsight for contemporary global-scale environmental analyses and reports. The main research goal is to cross-check the figures/vocabularies and predictions that appeared in the first global UN environmental report on the Earth’s environmental situation [15]. Moreover, we review the figures/vocabularies and predictions in the light of subsequent events. It is useful to reflect on the accuracy of decadal scale predictions and consider the reasons for any deviations. Prudent backward-looking decadal review is useful in steering contemporary projections. To ease the reading process, we mention “the UN report” referred to the above-mentioned report of 1969 unless another UN report is used with proper relevant reference.

Our analysis is based on (i) comparison of 1969 predictions with subsequent events and (ii) analysis of relevant environmental terms that were included or absent.

2. Numerical and Statistical Analysis

The UN report presents several key figures on various issues and topics: urbanization, number of vehicles, etc. The report also predicts future changes in various areas, e.g., CO₂ levels. Figures predicted in the UN report (1969) [15] are compared with actual modern figures in Table 1.

These figures reveal several major over- and under-predictions. For instance, the urban population has risen much faster and more broadly, especially in those developing countries with better economic performance (e.g., India). Use of pesticides has dramatically increased since then as a result of the intensification of agriculture worldwide. Such agricultural intensification and the unprecedented expansion of urbanisation have ravaged wildlife habitats and species extinction, as indicated in Table 1, however, species extinctions are four

orders of magnitude greater, and the number of endangered species is 500 times greater than predicted.

Table 1. Cross-checking of figures proposed or predicted on selected themes of the environment in the UN report (1969) [15].

| Theme | Figures (the UN Report) | Figures (Present) | Source | % Difference (Predicted vs. Actual) |
|----------------------------------|-------------------------|--|--------|--|
| Urban population | 40% | 55% | [16] | 37% (in terms of total population numbers) |
| DDT usage (per year) | 50,000 tons | 3772 tons (year 2014) | [17] | −92% |
| Pesticides (per year) | 589,676 tonnes | 3.5 million tonnes | [18] | 600% |
| Land degradation of arable lands | 500 million ha | 1 to 6 billion ha | [19] | 200–1200% |
| Birds and animals being extinct | 150 species | 1 million species already face extinction, many within decades | [20] | >10000? |
| Endangered animal species | 1000 species | 500,000 animals and plants and 500,000 insects | [21] | 500% |

3. Cross-Checking of Keywords

Here, we compare the most frequent and widespread vocabularies and terms concerning environmental degradation and climate change used in the UN report versus official documents of the 21st Century (Table 2). These are evaluated separately below.

Table 2. Cited versus missing environmental concerns in the UN report (1969) [15].

| Cited (1969) | | Missing | |
|---------------------|-------------------|-------------------------------|---------------------------------|
| Carbon | Water | Ecosystem services | Environmental Impact Assessment |
| Coal | Radioactivity | Climate change | Ozone layer |
| Oil | Marine ecosystems | Carbon | Coral reefs |
| Pesticide/herbicide | Malaria | Food security | Renewable energy |
| Air pollution | | Temperature | Plastics |
| Rural areas | | Biodiversity | Coronavirus |
| Polar regions | | Desertification/Deforestation | Science-Policy Interface |

3.1. Carbon

The UN report refers to carbon only in three locations: “... a 10 percent increase in atmospheric carbon dioxide ... increase in carbon dioxide, particulate matter, and ... regulations for maximum admissible levels of carbon monoxide ...” ([15], p. 15). Interestingly, these three mentions were attributed only to exhaustion and combustion of vehicles. The report missed the most important sources of pollutants on Earth, such as power plants, domestic housing, agriculture, etc. Carbon is now one of the most frequent words in the vocabulary in online and offline media, especially concerning climate change.

3.2. Coal

Throughout the UN report, coal was referred to only in a few instances: “London has improved the quality of its air through restricting the use of coal ... waste products from the coal industry” ([15], p. 9). As it is evident, even these rare references to coal were limited to a city (London) and specific circumstances (coal waste). Critical words such as ‘temperature rise’ and ‘global warming’ were not attributed to coal-burning. In the 1960s, the world had already started to transition from coal to oil [17], though coal still was used widely as an energy source. Coal consumption for electricity generation has not subsided as it constitutes the third global sources (Figure 1). Today’s sentiments on coal are reiterated loudly both inside and outside the countries. Demonstrations of people worldwide oppose coal-mining and coal-burnt power plants to be developed. The UN

Secretary-General António Guterres' statement on the Intergovernmental Panel on Climate Change (IPCC) in 2021: "There must be no new coal plants built after 2021".

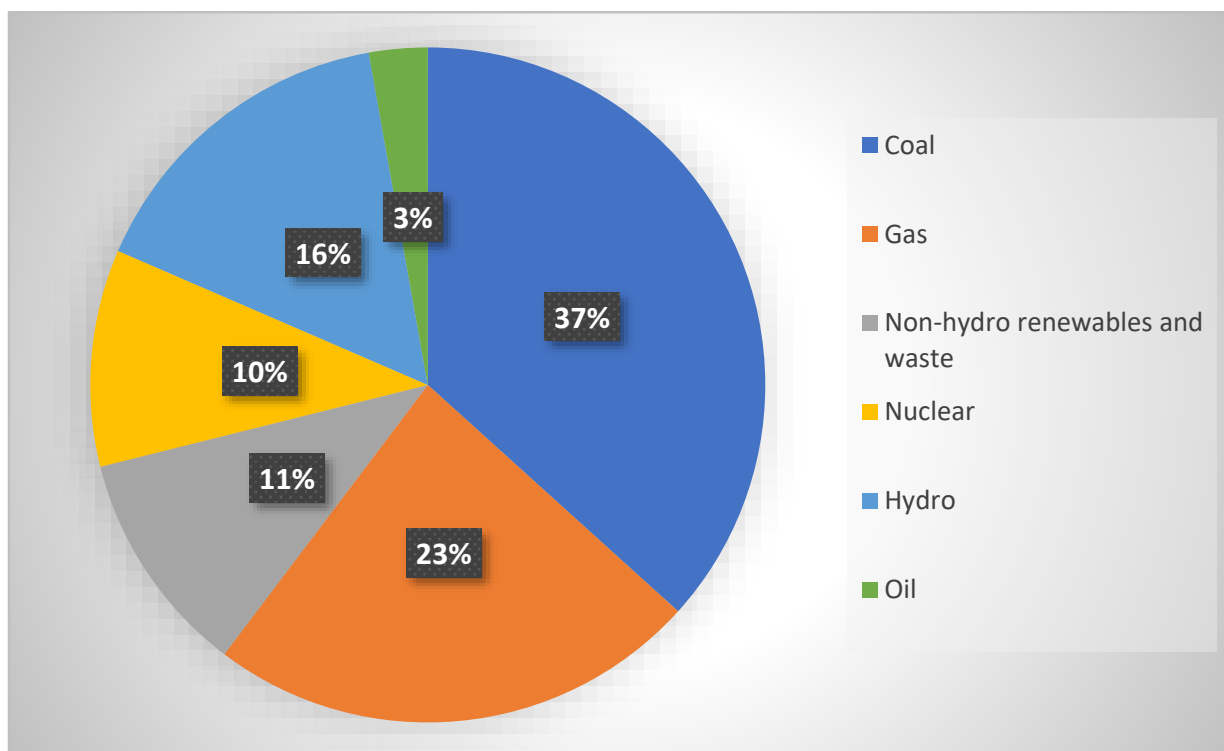


Figure 1. Global share of electricity generation, 2019 (Drawn by authors based on IEA [22]).

3.3. Oil

The word "Oil" was repeated in the report several times but in all cases referred to the role of oil in polluting marine ecosystems, not oil as a significant fossil fuel in increasing greenhouse gas emissions: "Oil has been in existence since 1954, oil pollution remains a major concern...Pollution of the sea stemming from sub-sea mineral exploitation, notably the danger of blow-outs of off-shore oil drilling" ([15], p. 43). The situation has not improved. According to IPBES [20], ocean mining has expanded since 1981 to 6500 offshore oil and gas installations in 53 countries.

3.4. Pesticides/Herbicides

The UN report emphasizes high applications of DDT or other agricultural chemicals as factors polluting soil and water resources at that time. In several instances in the report, their wide usage is fortified by some figures to highlight the relevant impacts on the environment. Since then, the usage of pesticides and herbicides have increased with severe consequences on soil and marine biological systems (e.g., [20]).

3.5. Urbanisation

The report's overarching theme evolves around urbanisation and its growing impacts. It provides various examples and evidence from cities to explain the issues. It directly emphasises land use planning to resolve urban problems. The UN report rightly warned of the increasing impact of waves of urbanisation through the expansion of slums: "In the large cities, slums of the most wretched nature often become the environment of people who once lived in greater dignity and better health on rural lands" ([15], pp. 4–5). According to the recent report of UN-Habitat [16], slums have become typical dwellings for 1 billion people of the urban population.

3.6. Air Pollution

The UN report explicitly refers to air pollution “resulting from the combustion of fossil fuels for space heating, industrial power, or transportation . . . ” ([15], p. 9). Exemplifying two cities, London and Los Angeles, the report highlights these two cities’ ineffectiveness to cope with air pollution. In 1952, the ‘Great London Smog’ episode killed thousands, prompting the UK government to introduce the first Clean Air Act (1956) [3].

3.7. Rural Areas

The UN report underlines two challenges for rural areas: first, a decline in the number of people wishing to live close to their farms or villages; and second, increasing desires of people to acquiring a second residence in the county for weekends and recreation [15]. These issues are still relevant to our contemporary era [23].

3.8. Polar Regions

Arctic and Antarctic regions are mentioned in the UN report but not from the modern viewpoint. In a few places, the report mentions the Arctic region. In one particular notion, the report refers to its environmental problems resulting from human activity, which are few and highlights the role of shared research. Moreover, in another place, it refers to the Antarctic continent, which is “only of marginal immediate concern to man” ([15], p. 26). 50 years later the condition of polar ice sheets is high in the global consciousness. The average annual land surface air temperature north of 60° N for October 2019–September 2020 was the second-highest on record since at least 1900, and the end of summer sea ice extent in 2020 was the second-lowest in the 42-year satellite record [24].

3.9. Water

Water is one of the most frequent keywords in the report. Water-related problems are mentioned from various perspectives including management, health, pollution, and distribution. For instance, referring to large-scale water transfer schemes, the report rightly stresses that in these projects, “the broader environmental impact is inadequately considered” ([15], p. 12). Currently, both quantity and quality of water continue to be real concerns across the globe. Frequent droughts and floods have caused and continue to cause disturbances both in agricultural and urban settings and access to clean drinking water remains a major challenge.

3.10. Radioactivity

The UN report refers to environmental pollutions of nuclear power plants. “Pollution from radioactive material is a danger which could become of greater significance as increased reliance is placed on nuclear power and, eventually, if nuclear explosives for engineering purposes were to be used” ([15], p. 15). The prediction was correct as the world has witnessed two significant incidences in Ukraine and Japan since then. Still, the nuclear energy is an on-going option for electricity generation (Figure 1).

3.11. Marine Ecosystems

The report, in several paragraphs, also noted marine environments. The report specifically highlights the issue of over-exploitation in the fisheries industry: “The decline of certain species of whales and seals, of sea turtles, of the Pacific sardine and Atlantic salmon fisheries (as well as the continuing over-exploitation of the eastern Pacific anchoveta fishery are examples” [15], p. 15). Moreover, the report underscores oil pollution as a major concern. Since then, several oil leakage incidences have occurred, notably in the USA.

3.12. Malaria

The UN report highlights diseases such as malaria. It has been a real problem globally. According to WHO [25], only 11 countries have been certified so far as Malaria-free coun-

tries in the world. In 2019, there were an estimated 229 million cases and 409,000 deaths of malaria worldwide [25].

4. Missing Keywords—Unanticipated Problems of the Human Environment

The explicit mentioning of some keywords that constitute our concerns today were absent in the UN report. Since the UN report published in 1969, many newly terms, concepts and concerns have been coined or metamorphosed to more holistic terms.

4.1. Ecosystem Services

The report does not explicitly mention ecosystem services, but it is probably the first indirect notion of this term in an official document. It is read: “Urbanization . . . providing goods and services in quantity and diversity . . . ” ([15], p. 4). In fact, the provision of goods and services is a pivotal block of the structure of the modern term ‘ecosystem services’. Moreover, the report refers indirectly to another function of ecosystem services: “Areas of natural beauty . . . have a social function of providing recreation facilities for city-dwellers, beside their intrinsic value as part of a common heritage” (Ibid p. 8). It refers to “rural lands while preserving . . . their plant and animal life and the aesthetic, scientific and recreational values of their landscapes” (Ibid p. 12). The report even suggests monetary assessment of the environment: “The economic evaluation of the effects of environmental deterioration is . . . seldom integrated with the other elements of a given development programme . . . cost-benefit analysis is applied on . . . water quality management in the Ohio valley and Delaware estuary” (Ibid p. 19).

4.2. Climate Change

As expected, no direct mention of the ‘climate change’ term was recorded in the UN report. We cannot count this as a shortcoming as, for instance, the report reminds all of “The need for continual monitoring to detect changes in the earth’s atmosphere and its weather and climate” ([15], p. 16). Moreover, the report stresses “the problem of changes of climate” in another related sentence. There is no agreement when the ‘climate change’ term has been quoted directly for the first time. The first possible reference comes from the Swedish chemist Svante Arrhenius at the end of the 19th century, who mentioned that emissions of carbon dioxide could warm the earth in the long run [11]. For the contemporary era, however, the first combination of climate and change can be referred to Intergovernmental Panel on Climate Change (IPCC) that was formed in 1988 [26].

4.3. Food Security

The UN report does not refer directly to food security. Still, it provides evidence: “Food supplies may be inadequate, badly distributed, or prepared and sold under unhygienic conditions. Malnutrition is not uncommon” ([15], p. 8). Such issues are still relevant to our contemporary world. While many people are starving, large amounts of food are lost during production, transportation and storage.

4.4. Temperature

A missing term in the UN report is ‘temperature’ or any notion of ‘warming’. There is no doubt that the warming and temperature rise were relevant as industrialisation could not occur without generating heating. Such voracious industries and manufacturing processes could result in severe temperature rise during the 1960s.

4.5. Biodiversity

Biodiversity or biological diversity are not mentioned directly in the UN report. Nevertheless, the report emphasised some of its elements such as wildlife and plant resources.

4.6. Desertification/Deforestation

The word desertification did not appear in the UN report. However, the report mentioned vocabulary such as erosion, soil deterioration, destruction of farming lands which, per se, indicate desertification. The report also mentioned deforestation in two instances, though ‘destruction of valuable forest resources’ and ‘the exploitation of forests for timber’ were reiterated. Moreover, words such as ‘afforestation’, ‘reafforestation’ and ‘the establishment and protection of forests’ were noted in the report. Deforestation is under scrutiny across the countries and is related to their economic policies (e.g., [27]).

4.7. Environmental Impact Assessment

The term “Environmental Impact Assessment (EIA)” was not coined at that time, but the UN report indirectly highlights the need for EIA in many projects. During that time, “Environmental impact statements” were institutionalised [6]. EIA is an important undertaking nowadays, though the issue has been systematically ignored in drylands over the past [28].

4.8. Ozone Layer

The UN report does not mention about the Ozone layer depletion, though it refers to “carbon dioxide, particulate matter, and various toxic and radioactive materials in the atmosphere which could have long-term deleterious effects” ([15], p. 14). It was not until 1974 when scientists suggested, for the first time, that chlorofluorocarbons (CFCs) may be causing a thinning of the ozone layer [3]. Later, the Ozone depletion problem became global on 15 September 1987 when ‘the Montreal Protocol’ became the only UN treaty ever that had been ratified by every country on Earth (Montreal Protocol 2021). The Parties to the Protocol have phased out 98% of ozone depleting substances (ODS) globally compared to 1990 levels (Ibid). Without this treaty, ozone depletion would have increased tenfold by 2050 compared to current levels and resulted in millions of additional cases of melanoma, other cancers and eye cataracts (Ibid).

4.9. Coral Reefs

Coral reefs are not mentioned in the UN report. However, the report highlights the consequences of “the release of radioactive isotopes, the discharge of toxic materials, excessive nutrients, or heated water into estuaries of coastal waters on which the productivity of the oceans is dependent” ([15], p. 14). Worldwide, coral reefs are threatened, lost and projected to decline by a further 70–90% at global warming of 1.5 °C [20].

4.10. Renewable Energy

The UN report does not consider renewables, though hydroelectric dams had been developed extensively worldwide in the 1920s [29]. The construction of dams in developed nations was stopped in the late 1960s (Ibid), but large dams were expanded elsewhere in developing countries (e.g., China and Iran). The world must wait longer to see some tangible signs of progress in renewable energies (mainly solar and wind energies) until the early 2000s.

4.11. Plastics

The word “plastic” is not mentioned in the UN report, despite being invented a century ago. Apparently, the usage of plastics was not widespread, and thus, their impacts on land and marine ecosystems were not measured or studied in the 1960s. Currently, non-biodegradable plastics and micro-plastics have become severe environmental challenges that are polluting our soils and oceans while entering food chains (e.g., [30]). Our current oceans and marine ecosystems are experiencing the highest pollution level, possibly in the entire recorded history. The extinct and endangered marine species are substituted by a diverse shape and size of plastics and debris. Marine plastic pollution has increased tenfold

since 1980, affecting at least 267 species, including 86% of marine turtles, 44% of seabirds and 43% of marine mammals [20].

4.12. *Coronavirus*

Clearly, the report does not mention the coronavirus diseases (including SARS or COVID-19). However, it uses the surrogate word of respiratory infections disease to highlight the growing overcrowding of urban areas that “encourage upper respiratory infections and venereal disease. This pattern in the propagation of disease overtaxes the whole medical care organization” ([15], p. 8). In particular, the notion of ‘overtaxes of medical institutions’ reminds us of the recent burdens of medical staff and hospitals to tackle the COVID-19 Pandemic. Compared to 1969, contemporary societies face more diverse medical problematic issues, notably zoonotic diseases due to converting natural habitats to urban areas. Contagious diseases could be one of the side effects of rising urbanisation while rural areas are deteriorating and lost [23].

4.13. *Science-Policy Interface*

Like what we see today [31], the UN report highlights the weak link between scientists and policymakers. It states that: “... appropriate arrangements do not seem to exist for the provision of such information to the authorities and personalities responsible for management and control of the environment” ([15], p. 19). The first effective contact between science and policymaking and the political processes occurred after World War II in the US when a science and technology advisor was appointed in 1957 [31]. However, the term ‘Science-Policy Interface’ is a 21st century vocabulary.

5. Discussion

5.1. *Scientific Documents: Facts or Myths*

Words are powerful tools to convey feelings or messages. They are funnelled by societies directly through documents or media. In the UK, for instance, the word ‘Doomwatch’, coined based on a TV series on environmental issues, entered the Oxford English Dictionary in 1970 [5].

The word ‘document’ is “derived from the Latin ‘*docere*’: to teach, and it means ‘instruction; a warning; a paper or other material thing affording information, proof or evidence of anything” ([32], p. 109). Through various forms of documents, knowledge is preserved and shared [33]. Print documents have been instrumental in conveying knowledge, messages, hopes, fears, and predictions throughout history. Documents are invaluable as they depict events, inform peoples, record movements, reveal apparent or hidden social and economic flows, unsurfaced political intentions, scientific trends and achievements (e.g., [34]).

The superiority of science is quite well-established [35]. Nevertheless, scholars and scientific documents, including their facts and statistics, have always been looked at with suspicion, scepticism or distrust, attributed to the differences that exist in religion, political ideology, morality, and knowledge about science [36]. Yet, “science is distinguished in its claims of robustness through organized criticism and skepticism” ([31], p. 5).

The type of sceptic who hounded Galileo in the Middle Ages have become widespread across various scientific and political arenas globally. New deniers have become more educated, connected, informed, and approachable but are still motivated by some sense of denying and rejecting scientific facts as did Galileo’s ‘heliocentric model’ sceptics [36]. As such, “scientists are often perplexed by the apparent failure of their evidence to affect policy” ([37], p. 969).

There is no doubt that deniers were also part of the fabric of society in the 1960s when it was recognised that steps needed to be taken to save the environment. Therefore, it was sensible that, as administrative and financial justifications were needed to convene the Stockholm Conference, the mentioned UN report in 1969 had to provide more robust and potentially grim statistics and predictions for the global Powers and funders to be

convinced. How conservative these grim predictions turned out to be may well have been an indication of the economic conditions at the time.

5.2. Any Progress since 1969?!

There is no doubt that the world has seen unprecedented human impacts on the environment since the UN report (1969) [15]. The environment concept turned into a phase of institutionalisation in science, civic society, and politics around 1970 [38]. At the start of the 1970s, the term ‘sustainable development’ was coined, probably by Barbara Ward [4]. The first issue of the Journal ‘*Ambio*’ was published in 1972 as a journal about “the human–environment” in the same year the UN conference was held in Stockholm [38]. Many other specialised scientific environmental-related journals have emerged since then. The well-known Brundtland Commission report, ‘*Our Common Future*’ stressed the possibility of social equity, economic growth and environmental maintenance at the same time, while acknowledging the tension between economic growth and environmental protection [4]. The United Nations has established UNEP as well as Conventions of UNFCCC, UNCCD and CBD. The European Union adopted over 600 pieces of environmental legislation between 1970 and 2013 [39]. Since 2000, the Millennium Development Goals and Sustainable Development Goals have been developed. Worldwide ministries of the environment have been established [40]. Countries have embarked on efforts, technically and financially, to monitor, reclaim, and protect their environment. As such, the Environmental Impact Assessment has been included in many national legislations with varied success [28]. By providing solid evidence, the IPCC reports have opened new horizons in understanding the challenges ahead. Globally, the Ozone layer has been protected from further depletion through concerted global action [41]. The Green movements, Green political parties, and Green economies are gaining momentum in many states. In sum, several international agreements, initiatives, gatherings, and Conventions have been formed to address environmental challenges and governance at various scales [4,6,42].

However, not all efforts and reports have been equally influential. In assessing the Brundtland report, [6] (p. 2) concluded that “... the Brundtland Commission (1987) said little that was not said at Stockholm”. Other post-Stockholm Conferences have not been the panaceas, nothing substantial have been achieved, or have been even a wasted opportunity for progress [40,42,43]. As the costliest diplomatic gathering in history, the Rio Summit failed to be influential and achieved too-little, too-late [40], as have most of its descendants. Most of these multi-lateral and global agreements necessitate major financial commitments while being non-binding. Therefore, sceptical authorities can withdraw such global agreement unilaterally (as happened for the Paris Agreement in the US years ago). Those South–North quarrels during the Rio Summit [40] still exist, and even the disparities on ‘*who must do what first*’ have been deepening.

There is a long way to claim any success in preserving the remained critical patches of polars, Amazon forests, and coral reefs. “A vicious circle of poverty and ecological destruction has been set up, often as a direct result of ‘development’ [6] (p. 11). “In essence, ecology is being economized” [6] (p. 20).

5.3. Altered Human Footprint

As illustrated in Table 1, people’s footprints on the environment have increased since the UN report published in 1969. The overall trend has been negative for the environment as many unfavourable indicators have increased. Even declining trends for a few ones must not be interpreted misleadingly. For instance, DDT usage has declined dramatically in 45 years (92%) (Table 1), but 3772 tons of DDT was still applied in 2014 [17]. It also does not necessarily indicate any reduction in other herbicide consumptions at the global level. Many other chemicals are also used for agricultural productions. Population growth and the limitation of farm sizes have intensified high-yielding agriculture. These short high-yielding farming systems need extra support for controlling pests and diseases to lower the risks of financial losses. All in all, agriculture has triggered mass clearing of

natural forests and rangelands over the past, causing unimaginable impacts, including plants becoming extinct. According to WWF [21] (p. 36), “the number of documented plant extinctions is twice as many as for mammals, birds and amphibians combined”. Within decades, 1 million species face extinction [20].

The UN report [15] (p. 17) correctly mentions that “more emphasis has been placed so far on research in the physical and earth sciences than in the biological and social sciences”. We already observe negligence in addressing social aspects manifested by rising poverty and food insecurity in rural areas [23]. If we could not resolve these underpinning human challenges, we cannot expect deforestation, wildlife smuggling, or overstocking fisheries to be halted.

A recent so-called statement “a code red for humanity” made by the Secretary-General based on the latest IPCC Climate Report [44] was a general belief among most global leaders and scientists for bolding the climate change issue. The UN Secretary-General warned: “The alarm bells are deafening, and the evidence is irrefutable: greenhouse-gas emissions from fossil-fuel burning and deforestation are choking our planet and putting billions of people at immediate risk” [44].

The 20th century was ended by tremendous environmental impacts due to population growth which was increased by a factor of 4 and resulted in an increase in industrial outputs by 40, energy usage by 16 and carbon emissions by 10 [45]. The global economic growth, indicated by GDP, has increased since the 1960s (Figure 2). Overall, 75% of the Earth’s ice-free land surface has already been significantly altered [21]. Our next generations will re-evaluate such figures by the end of this century.

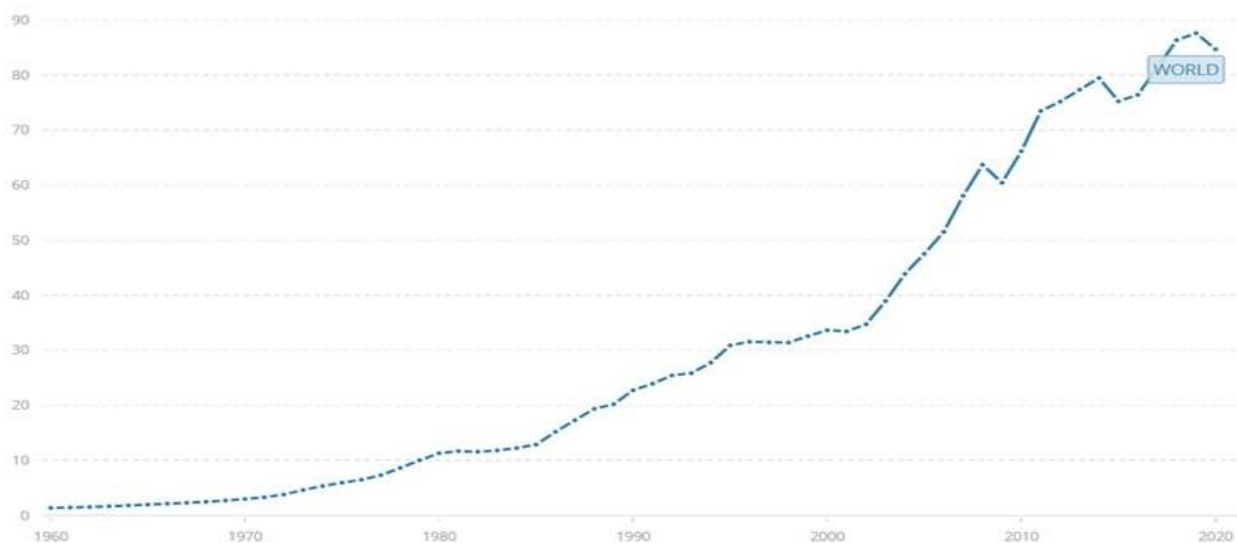


Figure 2. Global GDP (1960 onwards) (Y axis: Figures in \$Trillion) (Source: [46]).

6. Conclusions

The UN report [15] differs from the technical and scientific documents produced by the IPCC. It was prepared “on the basis of the very limited material . . . received from Governments” [15] (p. 16). Although it lacks standard elements of modern scientific documents (authors, references, diagrams, data, and statistical analysis), it provides a rare insight into at environmental challenges as they were perceived at the time. Also, it acted as a catalyst for launching the first crucial global summit to address environmental issues. Even if the quantification of indicators turned out to be faulty, many of the predictions and warnings (e.g., surge in respiratory diseases, rise of urban slums) are still relevant today. Many of the concerns highlighted in 1969 have not been addressed, but rather exacerbated.

The report could not foresee future technological innovations. For example, it did not refer to renewable energy technology which is now widespread. New developments includ-

ing fusion-based energy sources that are being planned are similarly difficult to anticipate, although it is likely that novel clean energy sources will be invented and developed.

Despite such inaccuracies in forecasting, the vital role of such global reports must be acknowledged. The 1969 UN report stimulated scientific research on a global scale and although many contemporary challenges were not mentioned, the report predicted or preempted many other concerns. For instance, the report highlighted the role of urbanisation in spreading respiratory diseases, a notable impact that has been observed several times since then (including the COVID-19 pandemic).

The 1969 UN report, as the first official UN report on the environment, was a critical founding element for the first global Stockholm Conference on the environment and the 1972 establishment of the first international organisation to address environmental issues (United Nations Environment Programme). The Stockholm conference brought an unprecedented 108 global leaders around one table to set aside an international platform for tackling rising environmental concerns. Perhaps, it was the first time in the history of humankind that the environment became a stimulating element of ‘unity’ among countries. It indeed opened a new transition toward thinking collectively regardless of political and economic differences. Environmental protection and conservation began to be incorporated into national developmental plans. Without such a global effort, there could have been no propeller of change in the poor and rich countries to form three international Conventions on climate change, biodiversity and combating desertification by the 1990s. In fact, double the number of countries that appeared in the Stockholm Conference officially signed these three Conventions. These efforts were also critical in establishing Green political movements across different countries.

The UN report [15] (p. 17) notes that “more emphasis has been placed so far on research in the physical and earth sciences than in the biological and social sciences”. This issue has not been resolved yet. Negligence in addressing social aspects associated with rising poverty and food insecurity in rural areas hampers progress in dealing with deforestation, wildlife smuggling, or overfishing.

Fifty years ago, scientists could not foresee the issues of today, nor make order-of-magnitude predictions of various indicators. Neither can contemporary researchers claim to foresee all the issues or confidently quantify many environmental parameters 50 years into the future. The revealed conservatism of the 1969 report mirrors concerns about current IPCC reports [47].

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