Chapter 1
The Impact of the Climate Change Discussion on Society, Science, Culture, and Politics: From *The Limits to Growth* via the Paris Agreement to a Binding Global Policy?

Odile Schwarz-Herion

Abstract The origin of the *Climate Change-by-CO_2-hypothesis* can be traced back to a study cited in the first *Club of Rome (COR)* report *The Limits to Growth* from 1972. The potential long-term impact of this report and subsequent reports to the Club of Rome (COR) in the 1970s marked the beginning of a series of Climate Change Conferences – from the *First World Climate Conference* in Geneva back in 1979 via the *UN Conference on Environment and Development (UNCED)* in *Rio de Janeiro* and the *Rio+ conferences* up to the *21st Conference of the Parties (COP21)* in Paris, followed by the *Paris Agreement* and the recent *COP22* in Marrakech. Since the Millennium, the Climate Change discussion, especially the predictions of the *Intergovernmental Panel on Climate Change (IPCC)*, has sparked controversies among scientists and scholars of various disciplines as shown, inter alia, by the so-called "ClimateGate"-scandal. Warlike Climate Change scenarios in weather disaster movies like *The Day After Tomorrow*, *Hell*, and *Snowpiercer* suggest that humans should act before it is too late, having a dramatic impact on the collective feeling that humankind is steering toward a climate catastrophe and the world is about to collapse. This fear might be exploited by those who strive for a binding global policy and the establishment of a global authority.

Keywords Climate Change discussion · UN Sustainable Development Goals · Club of Rome (COR) · Intergovernmental Panel on Climate Change (IPCC) · Conference of the Parties (COP) · Paris Agreement · Weather disaster movies · Global policy · Global authority

O. Schwarz-Herion (✉)
Dres. Shwarz-Herion KG Detective Agency, Ettlingen, Germany
e-mail: EOKK.Black@t-online.de

A. Omran, O. Schwarz-Herion (eds.), *The Impact of Climate Change on Our Life*, https://doi.org/10.1007/978-981-10-7748-7_1

1.1 Introduction

> Climate change is now affecting every country on every continent. It is disrupting national economies and affecting lives, costing people, communities and countries dearly today and even more tomorrow. People are experiencing the significant impacts of climate change, which include changing weather patterns, rising sea level, and more extreme weather events. The greenhouse gas emissions from human activities are driving climate change and continue to rise. They are now at their highest levels in history. Without action, the world's average surface temperature is projected to rise over the 21st century and is likely to surpass 3 degrees Celsius this century… (UN 2017a).

In this statement, the UN stresses the dramatic impact of Climate Change on all pillars of Sustainable Development (economic, social, and ecological) before leading over to the *21st Conference of the Parties (COP21)* in Paris from December 2015 and the subsequent *Paris Agreement* which entered into force on November 4, 2016 (UN 2017a; UNFCCC 2017a).[1]

The mandate to "take urgent action to combat climate change and its impacts" is listed as Goal 13 of the UN *Sustainable Development Goals* (UN 2017b). The inclusion of Climate Change as partial aspect of the ecological pillar of *Sustainable Development (SD)* into the UN *Sustainable Development Goals (SDGs)* links Climate Change directly to SD which might be defined as a development preserving existing essential items, systems, and values while adapting to new conditions in a flexible way under consideration of ecological, social, and economic aspects (Schwarz-Herion 2015a).

The SDGs are based on the *Rio + 20* outcome document *The Future We Want*. This document had set out mandates "...to establish an Open Working Group to develop a set of Sustainable Development Goals for consideration and appropriate action by the General Assembly at its 68th session..." (UN 2017b) and to ensure that the SDGs would be "...coherent with and integrated into the UN development agenda beyond 2015..." (UN 2017b).

The IPCC's reported findings include an average global temperature increase by 0.85 °C from 1880 to 2012, resulting into a decline in grain yield of maize, wheat, and other significant crops by 40 megatons per year from 1981 to 2002, an expansion of the oceans with a rise of the global average sea level by 19 cm due to warming and melting ice, and a shrink of the Arctic sea with a 1.07 million km^2 of ice loss per decade since 1979 (UN 2017a, with further references). According to the IPCC, "...it is likely that by the end of this century, the increase in global temperature will exceed 1.5°C..." (UN 2017a, with further references) as compared to the period from 1850 to 1900, the average sea level will rise by 24–30 cm in 2065 and 40–63 cm in 2100 due to the current concentrations and continued emissions of greenhouse gases, and "...most aspects of climate change will persist for many centuries even if the emissions are stopped" (UN 2017a, with further references).

Furthermore, the IPCC states that there were an increase of global CO_2 emissions by almost 50% since 1990 and a faster growth of emissions between 2000 and 2010

[1] United Nations Framework Convention on Climate Change.

than in any of the previous decades. The IPCC claims that a range of technological measures along with a "major institutional and technological change" (UN 2017a) will significantly increase the chance that "global warming will not exceed this threshold" (UN 2017a). So, the IPCC which is currently in its Sixth Assessment cycle (IPCC 2017a) expressly encourages technological innovations along with political reforms to deal with Climate Change.

Although the IPCC report cites concrete numbers and figures, the word "likely" regarding a certain temperature increase at the end of this century shows that the extent of Climate Change could not yet be fully clarified according to the IPCC. Other aspects of Climate Change remain equally controversial among scientists and scholars (PPO 2017a; Costella 2010). This includes the question if Climate Change is mainly due to natural or to human factors; the question whether mainly CO_2 and other greenhouse gases from **inadvertent** human activities like burning fossil fuels for industry, households, and street traffic or **deliberate** human activities like covert targeted weather modification and climate engineering are the main causes of Climate Change; as well as the question in how far anthropogenic (human-made) Climate Change is responsible for weather disasters and extreme weather patterns like heat waves, droughts, and frost (PPO 2017a; Costella 2010; Spencer 2007). Repeated claims of a "97% consensus" concerning supposed findings for certain Climate Change causes (Cook et al. 2013; NASA 2017) have triggered serious criticism (Ritchie 2016; Tuttle 2015).

Science is always in motion. An alleged "consensus" about any scientific finding is problematic and often untenable – especially if there are strong indicators that industrial lobbyists, covert political transformers, and influential church leaders try to shape people's opinion about certain topics. Climate Change can only be tackled successfully if many different opinions of unbiased scientists and scholars are thoroughly researched and logical conclusions are drawn from their findings to figure out the main causes of Climate Change.

Especially the true origin and the further development of the mono-causal *Climate Change-by-CO_2-hypothesis* in the period after the Second World War are still basically unknown to the general public. Since information and enlightenment are essential for an objective scientific discussion on Climate Change, the chapter at hand is supposed to fill this gap.

1.2 *The Limits to Growth* and Its Impact on Ecology, Economy, Politics, and Science

In 1972, a scientific report to the *Club of Rome*[2]*(COR)* entitled *The Limits to Growth* (Meadows et al. 1972) did not only discuss potential limits of further exponential economic growth, exponential population growth, industrialization, environmental

[2] Detailed information on the Club of Rome can be found on its website (Club of Rome 2017a).

pollution, food production, and exploitation of natural resources but also did the following startling prediction:

> At present about 97 percent of mankind's industrial energy production comes from fossil fuels (coal, oil, and natural gas). When these fuels are burned, they release, among other substances, carbon dioxide (CO_2) in the atmosphere…the measured amount of CO_2 is increasing exponentially apparently at a rate of about 0.2 percent per year…If the energy source is something other than incident solar energy (e.g. fossil fuels or atomic energy) that heat will result in warming the atmosphere….(Meadows et al. 1972 with references to Machta 1971; UN Department of Economic and Social affairs 1970; Bolin 1970; Inadvertent Climate Modification 1971)

This statement was based on observations of atmospheric concentrations of CO_2 at Mauna Loa, Hawaii, in 1958 which had reportedly increased steadily and averaged ca. 1.5 parts per million (ppm) each year. Calculations considering the well-known exchanges of CO_2 between atmosphere, biosphere, and the oceans predicted that the CO_2 concentration would reach 380 ppm by the year 2000, forming an increase of almost 30% of the supposed value in 1860. This "exponential increase in atmospheric CO_2" (Meadows et al. 1972 with reference to Machta 1971) was attributed to man's growing combustion of fossil fuels (Meadows et al. 1972 with reference to Machta 1971).

So, anthropogenic warming by industrial CO_2 emissions was already addressed in the early 1970s as a side aspect of this report which focused on the limits of economic growth and population growth due to reportedly increasingly scarce resources like food and fossil energies (Meadows et al. 1972). Written for the Club of Rome (COR) by an MIT research team under Dennis and Donella Meadows, *The Limits to Growth* was widely disseminated on a global base – with 12 million copies and translations into 37 languages (Suter 1999). Nonetheless, back then, *The Limits to Growth* was mainly embraced by environmentalists, whereas most politicians, managers, and economists showed little interest in it (Colombo 1997); some scientists and scholars even openly criticized it (Solow 1973; Shubik 1972; Kaysen 1972).

Already MIT scientist Jay Forrester's *World Dynamics* model (*World2*) as precursor model of the *World3* model on which *The Limits to Growth* was based had been criticized because of the model description of the world as a nonlinear feedback system, the application of computer modeling for social developments, and the infringement of scientific approach in the absence of empirical verifiability of the validity of such models (Shubik 1972). *The Limits to Growth* was mainly criticized by economists who considered the demand for a general state of equilibrium as unrealistic, arguing that the limitation of the raw materials was not a problem, since humans had always been able to adapt to resource constraints. *The Limits to Growth* was also criticized and ridiculed for its pessimistic view of the world (Solow 1973; Kaysen 1972).

In October 1973, however, the emerging global oil crisis seemed to support the report's message that excessive exploitation of nonrenewable resources would lead to serious problems (Colombo 1997). Nevertheless, the supposed economic necessity of the sudden explosion of the oil price due to the alleged shortage of oil supply would be called into question almost three decades later: In January 2001, *Ahmed Zaki Yamani* who had been the oil minister of Saudi Arabia from 1962 to 1986 told *The Observer* that the *Shah of Iran* had exposed *Henry Kissinger* as the driving force

behind the increased oil price (The Observer 2001). Yamani also revealed that recently emerged documents from a secret conference proved that some British and US American state employees had been behind the orchestration of the increase of the oil price by 400% in the 1970s (The Observer 2001) – facts which had been completely unknown to the general public in the 1970s. Back then, *The Limits to Growth* and the subsequent oil crisis had led to a kind of win-win situation for different stakeholders: the environmental movement felt encouraged by the message that oil was a limited and environmentally harmful resource. Paradoxically, oil giants like the Rockefeller-owned *Exxon* equally benefited from the report's message that fossil fuels were a rare resource, because it provided a credible pretext for the significant increase in oil prices in the years following the publication of *The Limits to Growth.*

Henry Kissinger as string-puller behind the oil crisis of the 1970s had also played a major role in the Conference at which the authors of the book *Conditions of World Order* met in the Villa Serbelloni in Bellagio, Italy, from June 12 to 19, 1965, "… thanks to the hospitality of the Rockefeller Foundation" (Hoffmann et al. 1968), i.e., at the place where, according to some historians, also the foundation stone for the COR would be laid three years later in 1968 (Hap 2013; Rivera 1994), whereas the COR itself cites Rome as its official founding place – without mentioning any specific location (COR 2017a).

Allegedly, *Conditions of World Order* provided the base for *The Limits to Growth* (Hap 2013; Rivera 1994), although – except from the world food problem and the development of a new world model with the demand for a global government policy – at first glance, this book seems to have little in common with *The Limits to Growth*. Its possible connection to the topics of Climate Change and SD will be discussed in the final section of this chapter.

1.3 The Long-Term Impact of *The Limits to Growth* on International Climate Policy: From the First World Climate Conference in Geneva to COP21 in Paris and Beyond

The Limits to Growth (Meadows et al. 1972) is still listed as the most important report on the COR's website (COR 2017a), although it was succeeded by many other reports from 1975 to 2015 (COR 2017b). Six of them were published in the 1970s (COR 2017b):

- Mankind at the Turning Point (1975)
- Reshaping the International Order[3] (1976)
- Goals for Mankind (1977)
- Beyond the Age of Waste (1978)
- Energy: The Countdown (1979)
- No Limits to Learning (1979)

[3] This title indeed looks like an allusion to the book *Conditions of World Order*.

Perhaps inspired by the aforementioned COR reports, the late 1970s marked the start of a long series of international environmental conferences, especially Climate Conferences, finally leading to the COP21 Conference in Paris in 2015 and the Paris Agreement (UNFCCC 2017a), followed by the *22nd Conference of the Parties (COP22)* in Marrakech, Morocco (UNFCCC 2017b).

This series of international environmental conferences can be traced back to the *First World Climate Conference in Geneva* (February 12–23, 1979) at the invitation of the *World Meteorological Organization (WMO)*. Climate experts warned that the emission of greenhouse gases in the atmosphere could cause significant changes in the regional or even global climate, having a negative impact on the welfare of mankind. The *World Climate Research Programme (WCRP)* was established to further deepen the knowledge in this field (Staud 2015).

Nearly ten years later – on December 6, 1988 – the *Intergovernmental Panel on Climate Change (IPCC)* was established, based on *UN Resolution 43/53* (IPCC 2017a; Staud 2015) and sponsored by WMO and the *United Nations Environment Programme (UNEP)*. Every 6 years, experts from all over the globe produce their reports independently in three working groups; the short summaries are supposed to influence the governments of the 195 member states (IPCC 2017b; Staud 2015).

11 years after the launch of the *WCRP* and two years after the *IPCC First Assessment Report*, over 1000 experts and government representatives met in Geneva (October 29, 1990, to November 7, 1990) for the *Second World Climate Conference* (UNFCCC 2017c) where Margaret Thatcher stated: "The later we become active against climate change, the more expensive it becomes" (Staud 2015). Six weeks later, the UN General Assembly decided to start negotiations on a global climate deal (UNFCCC 2017c; Staud 2015).

At the *UN Conference on Environment and Development (UNCED)* in *Rio de Janeiro, Brazil,* June 3–14, 1992, the *Agenda 21*, the *Rio Declaration on Environment and Development,* and the *Statement of Principles for the Sustainable Management of Forests* were adopted by more than 178 governments (UN 2017c). On June 5, 1992, the *Convention on Biological Diversity (CBD)*, based on the controversial *Wildland Project,* which – with its core reserves (wilderness areas), corridors, and buffer zones – involves the risk of nationalization of private property in these areas, while shutting down half of the agriculture and reducing biodiversity instead of protecting it as revealed by official environmental statements (Coffman 2009), was opened for signature which would finally enter into force on December 29, 1993 (CBD 2017).

The *Agenda 21*, "...a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment..." (UN 2017c), has long-term effects on environmental programs at the local level (Lexikon der Nachhaltigkeit 2015). In December 1992, the *Commission on Sustainable Development (CSD)* was created to supervise and report about the implementation of the agreements at the local, national, regional, and international levels. Additionally, a 5-year review of the Earth Summit progress scheduled for 1997 was decided in a special session of the UN General Assembly (UN 2017d).

In 1994, 155 countries signed the *United Nations Framework Convention on Climate Change (UNFCCC)*. It entered into force on March 21, 1994. The aim of Article 2 was "…to achieve the stabilization of greenhouse gas concentrations in the atmosphere at a level where a dangerous anthropogenic disturbance of the climate system is prevented" (Staud 2015).

From March 28 to April 7, 1995, the *First UN Climate Summit* took place in Berlin, where the signatory states of the Climate Convention met for the *First Conference of the Parties (COP1)*, led by *Angela Merkel* as the then *Minister of the Environment* of the host country Germany. Such *UN Climate Summits* were announced to be held annually. COP1 stated that state plans to reduce greenhouse gas emissions were **not** enough, mandating a working group to negotiate an additional protocol to the UNFCCC with **legally binding** emission reductions. It was also decided to establish the *Secretariat of the Climate Convention* in Bonn (Staud 2015). Since then, COP meets every year to take decisions that further the implementation of the Convention (UNFCCC 2017a, d).

From June 23 to 27, 1997, the *Rio + 5 Conference* took place in New York (UN 2017e). On December 11, 1997, at the *Third UN Climate Summit (COP3)* in Kyoto, Japan, the *Kyoto Protocol* as the **first legally binding agreement** on emission reduction was adopted. The EU with its then 15 members and further 23 industrialized countries committed themselves to reducing CO_2 and other greenhouse gases by an average of 5.2% by 2012. There were no similar requirements for developing countries because they hardly contributed to Climate Change. Germany undertook to reduce emissions by 21%. Although US President *Bill Clinton* signed the *Kyoto Protocol*, the *Senate* never ratified it (Staud 2015).

From July 16 to 27, 2001, there was a breakthrough at *COP6-2* in Bonn, an extension of *COP6* which had failed at the end of 2000 in The Hague, Netherlands. Back then, many states were slowing down, although the Third IPCC Assessment Report from 2001 warned that – until the end of the century – the earth could warm up to 5.8 °C. In early 2001, the newly elected President *George W. Bush* had declared the farewell to Kyoto for the United States. Finally, an agreement regarding the Kyoto Protocol was reached at COP6-2 but without the United States (Staud 2015).

From October 29 to November 10, 2001, at *COP7* in Marrakech, the compromises on the implementation of the Kyoto Protocol from *COP6-2* were described in the *Marrakech Accords*. The signatories were now entitled to claim forests and soils as CO_2 storage to compensate emissions. Industrialized countries could reduce emissions through projects abroad, so called "Joint Implementation" or "Clean Development Mechanism" (Staud 2015).

The *World Summit on Sustainable Development (WSSD)* in *Johannesburg*, South Africa, took place from August 26 to September 4, 2002. The full implementation of *Agenda 21*, the *Program for Further Implementation of Agenda 21*, and the commitments to the Rio principles were expressly confirmed (UN 2017c).

On February 16, 2005, the Kyoto Protocol entered into force. Over 100 states (by far more than the minimum requirement) ratified the agreement, but only the respective decision of the *Duma* in Russia at the end of 2004 led to the fulfillment of the second condition: the ratification states became responsible for 55% of the emis-

sions, which had to be reduced according to the Kyoto Protocol. The EU launched a trading system for CO_2 emission allowances in 2005 to meet its obligations (Staud 2015).

At *COP13* (December 3–14, 2007) on the Indonesian island of *Bali*, the timetable for a Kyoto successor protocol was adopted. As the protocol would have expired in 2012, a connection agreement was negotiated under high pressure: an alliance between the EU and developing countries or emerging countries was able to make the United States abandon its blockade. In 2007, the IPCC received the Nobel Prize for its *Fourth Assessment Report* (Staud 2015).

In December 2009, the "ClimateGate" revelations about (suspected) manipulations of climate models irritated the scientific world and the general public (Booker 2009): *COP15* in *Copenhagen* (December 7–18, 2009), into which higher expectations had been placed than in any other Climate Summit before and where a connecting accord for the Kyoto Protocol had been planned, ended up with the "failure of Copenhagen" (Staud 2015). While the heads of state and the governments of many important countries negotiated every single word, other states denied their formal approval; the *Copenhagen Accord* remained a non-binding accord. The industrialized countries agreed to help the developing countries in climate protection and adaptation to the consequences of Climate Change by an annual contribution of 100 billion euros (Staud 2015).

After the failure of Copenhagen, the climate studies advanced in small steps. Although no agreement had been reached on a follow-up to the Kyoto Protocol, a restart at *COP16* (November 29 to December 10, 2010) in *Cancún* took place where the participating states explicitly decided for the first time in Climate Conference history to limit global warming to a maximum of 2 °C as compared to the preindustrial level (with the option to lower the limit later on to 1.5 °C). A *Green Climate Fund* was set up to manage the money which had been promised for the developing countries in Copenhagen. The participants of *COP16* adopted measures to protect the forests (Staud 2015).

At *COP17* in *Durban*, South Africa (November 28 to December 11, 2011), China and the United States made a move. The *Durban Platform*, adopted at *COP17,* brought about some progress: the United States agreed to the goal of a new, legally binding Climate Treaty. And for the first time, developing and emerging countries such as China generally agreed to abide to emission restrictions; the new contract should enter into force in 2020, but no agreement on how to proceed had been done. Nevertheless, the countries of the world finally decided to reach an agreement with *COP21* in 2015 (Staud 2015).

At *Cop18 (Kyoto II)*, November 26 to December 7, 2012, in *Doha (Qatar)*, the Kyoto Protocol has been extended to fill the gap to a new climate contract scheduled for 2020: the EU with its 27 member states and 10 other industrialized countries agreed to a "second commitment period." All in all, their target was to reduce their greenhouse gas emissions by 18% as compared to 1990 levels. However, as Japan, Canada, Russia, and the United States refused, and the Kyoto Protocol did not provide any obligations for emerging countries such as Brazil, China, or India anyway, the agreement concerned only 15 percent of global emissions (Staud 2015).

At *COP20* (December 1–14, 2014) in *Lima*, the delegates agreed on a first text draft for the new climate agreement to be decided in Paris in 2015. Now, in addition to the industrialized countries, the emerging and developing countries should also be obliged. By spring, all states were expected to report their targets to the *UN Climate Secretariat*, but according to expert estimates, they were far from reaching the goal of keeping global warming below 2 °C. Further commitments by industrialized countries and developing countries filled the *Green Climate Fund* with a total of 10 billion US dollars (Staud 2015).

The *Paris Climate Conference* was announced on the UN website as "the 21st Conference of the Parties" (*COP21*) to the *UNFCCC*. COP21 was scheduled simultaneously to *CMP11*, the *11th meeting of the Parties to the Kyoto Protocol*, which supervises the implementation of the Kyoto Protocol and the decisions taken to enhance its effectiveness (UN 2017f).

COP21 in Paris took place from November 30 to December 12, 2015. After a 4-year period of tough negotiations, the Parties to the UNFCCC reached a *landmark agreement* by ending the strict differentiation between developed and developing countries, replacing it with a common framework that committed all countries to do their best in the future (C2ES 2017).

Key outcomes of this conference were the Paris Agreement from November 2016 and a companion decision by the Parties which included reaffirming the objective of limiting global temperature increase "...well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees..." (C2ES 2015), to set up "...binding commitments by all Parties to make 'nationally determined contributions' (NDCs) and to pursue domestic measures aimed at achieving them..." (C2ES 2015), to oblige "...all countries to report regularly on their emissions and 'progress made in implementing and achieving' their NDCs and to undergo international review..." (Raman 2016; C2ES 2015), and to "…extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025 and extend a mechanism to address 'loss and damage' resulting from climate change, which explicitly will not involve or provide a basis for any liability…" (C2ES 2015).

From November 7 to 18, 2016, *COP22* took place in *Marrakech*, *Morocco*, as a message to the world that "...the implementation of the Paris Agreement is underway and the constructive spirit of multilateral cooperation on climate change continues..." (UNFCCC 2017b). COP22 was also "...the twelfth session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP 12), and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA 1)..." (UNFCCC 2017b).

On June 1, 2017, US President *Donald Trump* said in a speech that "…the United States will cease all implementation of the non-binding Paris Accord and the draconian financial and economic burdens the agreement imposes..." (Trump 2017), thus "…ending the implementation of the nationally determined contribution and…the Green Climate Fund which is costing the United States a vast fortune…this agreement is less about the climate and more about other countries gaining a financial advantage over the United States..." (Trump 2017). Trump pointed out that "…even

if the Paris Agreement were implemented in full, with total compliance from all nations, it is estimated it would only produce a two-tenths of one degree…Celsius reduction in global temperature by the year 2100" (Trump 2017) and quoted a Wall Street article: "The reality is that withdrawing is in America's economic interest and won't matter much to the climate" (Trump 2017, with further references).

1.4 The Development of the Climate Change Discussion from 1988 to 2017: The Impact of Scientific Controversies on the Perception of Anthropogenic Climate Change

After the report *The Limits to Growth* (see Sect. 1.2), the next "scientific milestone" which got a similar level of attention from scientists and some interest from the general public were statements by James E. Hansen from *NASA* in *The New York Times* in June 1988: Hansen testified before a Congressional Committee that "…it was 99 percent certain that the warming trend was not a natural variation but was caused by a buildup of carbon dioxide and other artificial gases in the atmosphere…" (Shabecoff 1988), wrongly implying that CO_2 was allegedly an "artificial gas," although it is actually a naturally occurring gas in the atmosphere (Gettelman and Rood 2016; Schwarz-Herion 2015b, with further references).

Hansen was also quoted with the following statements: "…'It is time to stop waffling so much and say that the evidence is pretty strong that the greenhouse effect is here…Global warming has reached a level such that we can ascribe with a high degree of confidence a cause and effect relationship between the greenhouse effect and observed warming…It is already happening now.' …" (Shabecoff 1988). Hansen and other scientists testifying before the *Senate Panel* in June 1988 cited mathematical models predicting since some years that a "...buildup of carbon dioxide from the burning of fossil fuels such as coal and oil and other gases emitted by human activities into the atmosphere would cause the earth's surface to warm by trapping infrared radiation from the sun, turning the entire earth into a kind of greenhouse..." (Shabecoff 1988).

Six months after the publication of the aforementioned article, the IPCC was established (see Sect. 1.3). Although the IPCC had become an established authority in the field of Climate Change soon after its creation in December 1988, the Climate Change topic stays as controversial as the panel itself.

In 1999, a petition was signed by 31,487 American scientists – among them 9029 with a PhD in natural sciences or engineering – "…urging the United states Government to reject the global warming agreement that was written in Kyoto, Japan, in December 1997, and any other similar proposals…" (PPO 2017a) by the argument that the proposed limits on greenhouse gases would "…harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind…" (PPO 2017a). The scientists expressed doubts about the

existence of hard scientific evidence that "…human release of carbon dioxide, methane, or other greenhouse gases is causing…" (PPO 2017a) or "…will cause catastrophic heating in the earth's climate and disruption in the earth's climate…" (PPO 2017a) in the near future, while highlighting scientific evidence for the many benefits of high atmospheric amounts of CO_2 on plants and animals (PPO 2017a). The signatories, listed with names and university degrees (PPO 2017d), refuted the allegations of "…'settled science' and an overwhelming 'consensus' in favor of the hypothesis of human-caused global warming and consequent climatological damage…" (PPO 2017c). They questioned claims of "…publicists at the United Nations, Mr. Al Gore, and their supporters…" (PPO 2017c) that only a few "skeptics" still doubted the catastrophic anthropogenic global warming development (PPO 2017c), stating that the anthropogenic global warming hypothesis was "…without scientific validity…" (PPO 2017a) and that "…government action on the basis of this hypothesis would unnecessarily and counterproductively damage both human prosperity and the natural environment of the Earth…" (PPO 2017a).

The methodology of the IPCC was equally criticized. The signatories challenged the UN's claims that the IPCC's research review was authored by nearly 600 scientists, arguing that these so-called "authors" were **only** allowed to comment on the **draft text**; the final version would neither correspond to nor include many of their comments, but would conform to the UN's objective in favor of "…world taxation and rationing of industrially-useful energy…" (PPO 2017b). Along with the petition, the scientists provided a representative review article encompassing 12 pages as a positive example for a transparent and serious scientific procedure, explaining that review articles would regularly ***not*** present new discoveries and that "…essential facts given in the review must be referenced to the peer-reviewed scientific research literature, so that the reader can check the assertions and conclusions of the article and obtain more detailed information about aspects that interest him…" (PPO 2017b).

In any case, the writer of this chapter witnessed that – in the period from 1999 to 2005 – most professors and students in environmental sciences stated that the anthropogenic Climate Change-by-greenhouse gases-hypothesis was anything but settled and had to be examined further. This was in contrast to sensational statements like the one of the UK's chief scientific advisor David King who tagged Climate Change as "...more dangerous than international terrorism" (Schwarz-Herion 2005, with further references).

Nevertheless, in 2006/2007, Nicholas Stern, a former *World Bank* economist and then economic advisor of the British Chancellor of the Exchequer, impressed the scientific world with the startling claim that the *gross national product* (GNP) would be reduced by 5-20% or even more if politics were unwilling to take measures against global warming, warning that this would trigger a global depression which would be even more dramatic than the *Word Economy Crisis of the 1930s*. This statement had been based on a study conducted by Stern for the British government in which he calculated the financial consequences of climate change for the world economy (Stern 2007). Soon after the *Stern review* came out, the support of the **mono-causal** anthropogenic Climate Change-by-greenhouse gases-hypothesis grew stronger in the academic world and in society as a whole. This might have been one of the reasons why the 1999 Petition Project was renewed in 2007.

The election of Obama in 2008 strengthened the supporters of the anthropogenic Climate Change hypothesis on a global base. Soon after his election, Obama confirmed his "...campaign vow to reduce climate-altering carbon dioxide emissions by 80 percent by 2050, and invest $150 billion in new energy-saving technologies..." when he spoke by video to a climate conference in Los Angeles: "...Now is the time to confront this challenge once and for all…Delay is no longer an option. Denial is no longer an acceptable response..." (Broder 2008).

One year later, however, the scientific world and the general public were shaken by the *ClimateGate* revelations: on November 19, 2009, thousands of emails and documents from the University of East Anglia's *Climatic Research Unit (CRU)* giving the impression of scientific fraud emerged (Costella 2010; Booker 2009). The media got wind of it very quickly. *The Guardian* articles, entitled "Climate Skeptics Claim Leaked Emails Are Evidence of Collusion Among Scientists" (Hickman and Randerson 2009) and "Pretending the Climate Email Leak Isn't a Crisis Won't Make It Go Away" (Monbiot 2009), stated that "...opaqueness and secrecy are the enemies of science…There is a word for the apparent repeated attempts to prevent disclosure revealed in these emails: unscientific" (Monbiot 2009).

Contradictory information about "leaking" via a whistle-blower versus "hacking" triggered further controversies. *The Wall Street Journal* headlined "Climate Emails Stoke Debate. Scientists' Leaked Correspondence Illustrates Bitter Feud over Global Warming" (Johnson 2009), whereas the NY Times headlined "Hacked Email Is New Fodder for Climate Dispute" (Ravkin 2009). Consequently, *The Guardian* asked: "Climate emails: were they really hacked or just sitting in cyberspace? Slack security or subversion at the university may have led to 'unintentional sharing', making the police investigation pointless", revealing that Climate email-"hackers" had "...access for over a month..." (The Guardian 2010).

A week after the scandal broke and the term "ClimateGate" had appeared on James Delingpole's *Telegraph* blog (Booker 2009), *The Telegraph* headlined "Climate Change: This Is the Worst Scientific Scandal of Our Generation" (Booker 2009), exposed "…the small group of scientists driving the worldwide alarm over global warming …", and stated that CRU's director *Philip Jones* with his connections to the *Hadley Centre* as part of the *UK Met Office* selected "…the majority of the IPCC's key scientific contributors, making his global temperature record the most important of the four sets of temperature data on which the IPCC and governments rely…for their predictions that the world will warm to catastrophic levels unless trillions of dollars are spent to avert it…" (Booker 2009).

The Telegraph called Jones "…a key part of the closely knit group of American and British scientists responsible for promoting that picture of world temperatures conveyed by Michael Mann's 'hockey stick' graph which 10 years ago turned climate history on its head by showing that, after 1,000 years of decline, global temperatures have recently shot up to their highest level in recorded history…the central icon of the entire man-made global warming movement" (Booker 2009), pointing out that the statistician Steve McIntyre had identified fundamental flaws in the "hockey stick" graph back in 2003 (Booker 2009). The leaked CRU emails involved influential personalities like Gavin Schmidt as "right-hand man to Al Gore's ally Dr

James Hansen" (Booker 2009). *The Telegraph* accused the scientists of deliberately having concealed the data on which their findings were based, exposing their claim of data loss as untrue: actually, the leaked emails showed that scientists had been actively advised to delete huge amounts of data after receipt of a freedom of information request, thus committing a criminal offense (Booker 2009).

The Telegraph criticized the use of computer programs, designed "…to lower past temperatures and to 'adjust' recent temperatures upwards…to convey the impression of an accelerated warming…" (Booker 2009). The newspaper exposed "…the ruthless way in which these academics have been determined to silence any expert questioning of the findings they have arrived at by such dubious methods… discrediting and freezing out any scientific journal which dares to publish their critics' work…" (Booker 2009) to keep any dissenting research out of the IPCC reports (Booker 2009). Finally, *The Telegraph* suspected that the inquiry into the CRU leaks requested by former Chancellor *Lord Nigel Lawson* and to be chaired by *Lord Rees*, the President of the *Royal Society*, a "shameless propagandist for the warmist cause" (Booker 2009), would **not** be conducted in an objective way and warned: "Our hopelessly compromised scientific establishment cannot be allowed to get away with a whitewash of what has become the greatest scientific scandal of our age" (Booker 2009).

A representative selection of the leaked (hacked?) email correspondences was edited and annotated in a scientific way in a publication entitled *The ClimateGate Emails* by the Australian *John Costella*, a trustworty judge of data reliability, who holds a PhD in physics and had been in charge of analyzing statistical data as data reliability engineer at the *Department of Defence* in 2006. This publication supports all accusations addressed in *The Telegraph* article. Furthermore, Costella provides many other details such as the key players' *Modus Operandi* (M.O.), e.g., "inventing" the 1995 winter temperatures; discussing machinations to influence the delegates in advance of the *Kyoto Protocol*, cabals to harass and silence critics like members of the former editorial board of the scientific journal *Climate Research*; or cunning ways to get scientific results which please the EU and to receive funds from *Shell* for their research (Costella 2010).

The ClimateGate scandal kept the media busy in the years following the scandal. In 2010, a *Spiegel Online* article headlined "Forscherskandal: Heißer Krieg ums Klima" ("Researcher's Scandal: Hot War on the Climate"). *Spiegel's* scientific journalist Bojanowski stated that climate researchers had gone into the trap of the industrial lobby. Having read and analyzed the over 1000 leaked ClimateGate emails, freely available on the Internet and covering a period of 15 years, *Spiegel* found out that leading researchers had become "…entangled into a fierce and serious trench war, partly by fierce external attacks, including media, environmental associations and politicians" (Bojanowski 2010). Stating that "uncertainties of the results of the research will probably continue to exist in climatology," *Spiegel* concluded: "Politicians should not listen to scientists who promise simple answers" (Bojanowski 2010).

After the temporary outburst of indignation in the scientific world and the media from 2009 to 2011, the ClimateGate affair was silenced rather quickly: by the end of July 2012, the *BBC* reported "Police end 'ClimateGate' inquiry", mentioning that

the *Norfolk Constabulary* saw no realistic prospect of finding the culprit responsible for the (supposed) hacking but also mentioned that the examination of the broader context had resulted in the scientists being cleared of malpractice (Black 2012).

1.5 Economic Aspects of the Climate Change Discussion and the Potential Economic Impact of the Paris Agreement

In 2015, *Nicholas Stern* published a book entitled *Why Are We Waiting? The Logic, Urgency, and Promise of Tackling Climate Change*. In this book, based on the reported findings of the IPCC from 2014 and on data from the *International Energy Agency* (IEA), Stern points out that "...the science of Climate Change should be the foundation both for an understanding of the issues and challenges and for any proposed responses to those challenges..." (Stern 2015). The main message of this book seems to be that the risks and costs of Climate Change are higher than Stern had supposed in his earlier review (see Sect. 1.4) and that technological innovation and international cooperation should be encouraged to reduce environmentally harmful emissions and to push economic growth at the same time (Stern 2015).

Stern appeals to the media to optimize the discussion on Climate Change: "The importance of frequent, accurate, clear, and accessible public discussion of climate change places a great responsibility on media organizations" (Stern 2015). He propagates the display of destruction by weather disasters like typhoons on TV to show the consequences of Climate Change and complains about a communication deficit regarding sound arguments in favor of Climate Change. Stern dedicates nearly 10% of his book to moral philosophy and political philosophy which did not appear in his earlier publications: "Climate change presents a range of normative moral and political questions that cannot be dodged" (Stern 2015).

In a report entitled *COP21 at Paris: The issues, the actors, and the road ahead on climate change*, a team of authors (mainly economists) – among them Nicholas Stern – had analyzed the expected effects of this Climate Summit just before COP21 at Paris (Bhattacharya et al. 2015). The authors stated that the governments from ca. 200 nations who would come together in Paris for COP21 had "high expectations", striving for a legally binding and universal agreement on reduction of global temperature increases, and that brooking experts had "…compiled a collection of comprehensive short briefs on key issues in climate action, including climate aid and finance, infrastructure, carbon pricing, the relationship between agriculture, and climate…" (Bhattacharya et al. 2015). They considered 2015 an especially successful year for "…climate change efforts, as the long-floundering U.N. process has finally begun to deliver some of what is needed" (Bhattacharya et al. 2015).

The authors predicted that COP21 would become "...an important turning point in the fight against climate change…" (Bhattacharya et al. 2015), underlining that all significant world leaders including the ones of China and the United States had

declared their readiness for "...an ambitious Paris agreement..." (Bhattacharya et al. 2015). The authors praised the UNFCCC's efforts to advance a new agreement for the period after 2020, stressing the supposed importance of pricing carbon and encouraging more discussion on the "…most cost-effective means to reduce emissions", e.g., "…reducing fossil fuel subsidies and pricing greenhouse gas emissions…" **rather than** "…assistance to poor countries for adaptation and mitigation... clean energy cooperation, forest preservation…" (Bhattacharya et al. 2015).

Bhattacharya et al. promoted infrastructure investment as "…key element of the climate change agenda…" (Bhattacharya et al. 2015), alleging that infrastructure would account for more than half of global carbon emissions, praising the *2009 Copenhagen Accord* as "…the first effort to spell out the financial implications of a global effort to reduce carbon emissions where developed countries obliged themselves to provide 30 billion dollars for mitigation and adaptation financing for the period 2010-2012, to mobilize 100 billion dollars per year by 2020…" (Bhattacharya et al. 2015). While propagating climate finance, the authors vilified agriculture as "…one of the foremost drivers…of climate change" (Bhattacharya et al. 2015), stating that – regarding agriculture – "…the COP21 agreement might best be dubbed 'Les Champs-Oubliés', or forgotten fields…" (Bhattacharya et al. 2015).

In sum, this report seemed to be completely focused on the economic pillar of SD while neglecting the ecological pillar by failing to promote inexpensive energy-efficient technology and forest preservation which is essential to provide natural sinks for CO_2 (Schwarz-Herion 2005, with further references). As the climate in most cities is by far worse than the climate in the countryside, the authors' denigration of agriculture, implying that further urbanization was supposedly the better alternative, is also problematic for the ecological pillar. Considering the content of the Paris Agreement (see Sect. 1.3), equally focusing on the economic pillar of SD, the aforementioned report might have had some influence on this agreement.

Soon after the Paris Agreement, a publication entitled *Report Report COP21: So, COP21 happened – what next?* which appeared in February 2016 gives a rather clear picture which stakeholders benefit from COP21 and the Paris Agreement. This "report report" highlights the basic points from recent reports of business groups and analysts. The author mentions that Al Gore's *Climate Reality Project* had called the Paris Agreement a "turning point" which had sent "...a clear signal to markets and investors that the future of energy is in renewables such as wind and solar…" (Hower 2016), pointing out that "...a low-carbon economy would be a boon to renewables, energy storage and the IT sector, among others..." (Hower 2016).

First, Hower summarizes the *Bloomberg Energy Finance Report* which gives a forecast for a significant increase in the total investment into lower-carbon technologies over the decade: "The 2 degrees Celsius scenario represents a $12.1 trillion investment opportunity for new renewable electric power generation over 25 years, or $485 billion per year on average. A majority of anticipated investment in new renewable power generation is likely to go toward emerging markets…Non-OECD countries are expected to attract $4.3 trillion for new renewables generation through 2040…." (Hower 2016, with further references). Hower basically confirms this view, predicting a huge "...market opportunity for small-scale solar and wind tech-

nologies, microgrids and energy efficiency innovations" (Hower 2016) for regions without any access or only limited access to electricity, helping the 1.1 billion people who had no reliable access to electricity yet to "...alleviate some longstanding social and environmental issues" (Hower 2016).

Certainly, reliable access to electricity facilitating the regular use of computers and cell phones in favor of information equality for people all over the world is generally desirable. It is also reasonable to use solar and wind energy which are basically "clean" renewable energies, if used in the proper way and at the right places (Schwarz-Herion 2015b, with further references). Nonetheless, people from different nations and cultures might have different priorities. It is questionable if investment into infrastructure projects in favor of energy security is a priority for those communities of developing countries who currently live off-grid – especially if current and future generations might accumulate debt for expensive infrastructure projects as it happened in the past (Perkins 2005) while putting windmills on land which might be needed for food and facing problems with heaps of electronic waste in a scope previously unknown to them.

Hower also basically supports the judgment of the *Sustainalytics Report*. This report praises the Paris Agreement as a "Triumph of the Optimists" (Hower 2016, with further references), predicts that subsequent national climate commitments might benefit from this "…positive long-term economic signal for low-carbon technologies…", and states that the Paris Agreement would help to foster low-carbon technologies, although the end of fossil energies would still lie in the far future and that companies like *Tesla*, *Cisco*, *Kellogg*, and *L'Oréal* allowed investors to make full use of "…the regulatory, market and physical impacts of climate change…" (Hower 2016, with further references).

Hower equally basically verifies the predictions of the *Accenture Report*, that the coming decades will lead to "...shifting patterns of global growth – particularly in emerging economies – making customers a 'moving target'", while demographic changes create big challenges for consumer and labor markets. According to Hower, digital empowerment will raise consumers' expectations and lead to increased competition between companies while data companies will have a huge potential concerning data collection. Hower additionally stresses that increasingly scarce resources will make it difficult to cope with decades of unrestrained growth and unsustainable consumption patterns (Hower 2016) but is optimistic that digital technology will play a major role in the future of sustainable business by optimizing resource efficiency and companies' accountability for their actions and that information communication technologies might create annually more than $11 trillion by 2030, "…equivalent of China's annual GDP in 2015…" (Hower 2016, with further references).

Admittedly, increased digitalization facilitates sharing best-practice SD concepts digitally on a global base but can also cause serious social problems by reducing labor force even further. Additionally, the short life of technological devices used in the framework of steadily expanding digital markets (Soltan 2016a) will produce an unprecedented amount of "technotrash" and "e-waste", further adding to the estimated 20–50 million tons of technotrash already produced annually on a global

base (Soltan 2016b) – ecological damages intrinsic to the *Fourth Industrial Revolution* (Ribeiro 2016).

According to the *Climate Policy Observer's* report *Carbon Market Monitor: America to the Rescue*, the carbon trading market showed two contrarotating trends in 2015: "Volumes continued to contract, and prices continued to increase" (Hower 2016, with further references). The North American markets showed growth in volume by 121% and growth in value by 220%, while Europe still remains the market leader (Hower 2016, with further references). Hower claims that the "...new growth of cap-and-trade in North American markets and continued growth in Europe..." were heartening and showed that "...climate change action won't stifle business growth", encouraging politics to strive for a low-carbon economy while keeping global temperatures at or below 2 °C in a "post-COP21 world" (Hower 2016).

So, influential business people seem to be very optimistic regarding the economic potential of Climate Change deals. This market optimism might be one of the reasons why the IPCC continues its work regardless of criticism.

1.6 Climate Change in the Media, Literature, and Cinema

Media coverage on anthropogenic Climate Change is suitable to shape public opinion and is largely responsible for the ways in which science is translated into policy regarding the environment, new technologies, and risks (Boykoff and Rajan 2007, with reference to Weingart et al. 2000). Since several years already, the mass media split the global public in different fractions: "climate supporters" or "climate alarmists" on the one hand and "climate skeptics" or "climate deniers" on the other hand (Wikipedia 2017; Wiki-Talk 2017). Although the topic of Climate Change has a huge media coverage in Europe, particularly in Germany, some complain that the impact of Climate Change would not get sufficient coverage in the US American media, since only few TV providers, e.g., PBS, featured "…stories on Pope Francis' environmental encyclical, the Paris Climate Summit, the Keystone Pipeline, and the Clean Power Plan..." (Yerman 2016).

Others make fun of the present notion considering the future as catastrophe – in cinema, science, and literature (Horn 2014). In "Zukunft als Katastrophe" ("Future as Catastrophe"), a "...scholarly, exciting essay on apocalypse presentations in literature and film..." (Hugendick 2014), the Germanist *Eva Horn* discusses the dangers of modern disaster awareness in literary and movie scenarios, enhancing fears of an apocalypse due to (alleged) overpopulation, providing the message that nature reconquers its space, depopulation and overpopulation scenarios leading to famine, occasionally coupled with cannibalism like in McCarthy's empty world in his post-apocalyptic novel *The Road*, the "compulsive denaturation of man" dreaming of his own extinction, and the risk of political instrumentalization, creating the impression that "…there must be no more compromises…that it has to be done, if there is still some time left to act…" (Horn 2014; Hugendick 2014).

This also goes for movies featuring Climate Change and weather disasters. Recently, *The Guardian* cited five movies as "the five best climate change films" (The Guardian 2017), reviewing them regarding ideological, environmental, and social messages as follows:

- In *Snowpiercer* (2013), directed by *Bong Joon-ho*, "…climate engineering has plunged the Earth into a new Ice Age, and the only survivors all inhabit a huge train that perpetually circumnavigates the globe…a microcosm of 21st-century society: multicultural but with 1% in charge of the engine…" (The Guardian 2017).
- *The Day After Tomorrow* (2004), directed by *Roland Emmerich*, "…his most clarion environmental statement...smuggles the eco-consciousness of the director's native Germany into the heart of Hollywood…visualizing the atmospheric consequences of the North Atlantic current slowing down and causing superstorms…Fans of unsubtle political statements could also thrill to the sight of southern American climate refugees streaming across the border to Mexico…" (The Guardian 2017).
- In *Hell (2011),* directed by *Tim Fehlbaum* and produced by Roland Emmerich, "…the Mad Max franchise takes place at the upper end of the thermometer's scale…A temperature rise has made daytime excursions dangerous…survivors trail distant birds in search of water…Hell mostly follows the post-apocalyptic playbook…The film's economic plotting…is a lesson in itself for a more resource-scarce world" (The Guardian 2017).
- *Beasts of the Southern Wild* (1995), featuring Kevin Costner, provides "...a different kind of rising sea picture…A six-year old Hush Puppy…living in a Louisiana bayou community called 'the bathtub' has a head full of premonitions of prehistoric aurochs that her teacher tells her will be released by melting ice caps. Their snouts and hooves represent a fear of ancient, resurgent nature… southern magical-realist fable, inspired by the Hurricane Katrina disaster…" (The Guardian 2017).
- In *Interstellar* (2014), directed by *Christopher Nolan*, "…giant dust storms causing crop blight that is destroying the global food supply…It's the last okra harvest ever, we're told. Everyone is in the last-chance saloon, scrabbling for basic resources…All the classic Midwest cornfield imagery isn't just Nolan's wake-up call to the most climate-change sceptic country, but a reminder to us all that any solution begins in the most familiar place: home" (The Guardian 2017).

The sudden Ice Age scenarios in the movies *Snowpiercer* and *The Day After Tomorrow* awaken associations to smoke-induced Climate Change from nuclear warfare as discussed in two *Science* papers from 1983, based on *Nuclear Winter* studies (Holbraad and Petersen 2013, with reference to Turco et al. 1983 and Ehrlich et al. 1983). Turco et al. used former models, originally developed "…to study the effects of volcanic eruptions…" (Turco et al. 1983), stating that nuclear war could trigger a major cooling of the Earth's atmosphere, the so-called "Nuclear Winter". Nuclear airburst of all yields would burn cities and forests; the dust and smoke would "…encircle the earth within 1 to 2 weeks…" (Turco et al. 1983) –

with the potential to reduce light levels to a minimum. The result would be subfreezing land temperatures ranging from −15 ° to −25 °C, even in summer (Turco et al. 1983). Ehrlich et al. cited studies of large-scale nuclear war (5000- to 10,000-MT yields), based on estimations that 750 million immediate deaths would result from blast alone. The combinations of the effects from blast, fire, and radiations might even cause 1.1 billion deaths along with ca. additional 1.1 billion injuries, erasing 30–50% of the total human population with the vast majority of fatalities in the Northern Hemisphere (Ehrlich et al. 1983).

In *The Day After Tomorrow*, equally the Northern Hemisphere is struck by the climate catastrophe, leading to the collapse of civilization: "Resonant images of a wall of water crashing down on Fifth Avenue in New York, the Empire State Building, and New York skyscrapers cracking apart, the Statue of Liberty half-buried in a frozen ice-block, and tornadoes ripping the letters of the Hollywood sign, produce an imagination of disaster that provides cautionary warnings about environmental breakdown" (Kellner 2009).

Although *The Day After Tomorrow* is not about nuclear war, it uses the "… devices of atomic cinema – focus on the destruction of cities, collective sacrifice and militarized response – to address a form of catastrophe larger than the national politics of the security state: radical climate change" (Holbraad and Petersen 2013). Its title equally seems to allude to the 1983 nuclear war film *The Day After*. Some movie analysts consider *The Day After Tomorrow* a "…loose remake of the 1961 feature *The Day the Earth caught Fire...*" (Holbraad and Petersen 2013) where an "…aggressive series of nuclear tests by the United States and Soviet Union knock the Earth off its axis, causing the planet to spin closer to the sun, and producing a nearly apocalyptic heat wave…" (Holbraad and Petersen 2013).

Emmerich seems to have known about the possibilities of Climate Change by weather manipulation decades before *The Day After Tomorrow*: his first movie *Noah's Ark Principle* (1984) had been a science fiction movie about weather control by the CIA (Film Atlas 2017; Maguire 2008) and came out just one year after the publication of the scientific papers about the *Nuclear Winter* studies mentioned above. The warlike scenarios in *The Day after Tomorrow* suggest that "…climatic affects would be as serious as war…" (Ehrlich et al. 1983), an aspect which was also addressed in a *Pentagon study* focusing on the national security implications of abrupt climate change, published a year before *The Day After Tomorrow* (Schwartz and Randell 2003).

Nevertheless, *The Day After Tomorrow* is outwardly based on the hypothesis that CO_2 emissions from fossil fuels were responsible for Climate Change. In the movie, paleoclimatologist Jack claims in a speech at a UN Conference in New Delhi that 10, 000 years ago, a global warming had changed the earth's climate and led to the Ice Age which might happen again in 100–1000 years if we wouldn't stop "polluting" the atmosphere: The melting of the polar ice caps would pour fresh water into the ocean, thus diluting the salt level and making the temperature of the ocean currents drop by 13 °C. This explanation was also provided in the aforementioned Pentagon study about Climate Change published in 2003 (Schwartz and Randell 2003; Schwarz-Herion 2005, with further references) which might have been one of

the reasons why this movie had drawn many professors and students from environmental sciences into the cinemas back in 2004. In the movie, Jack's prediction is time-wise even surpassed by the real happenings with Climate Change-related weather disasters like high floods, tornados, huge hailstones destroying Tokyo, and snowstorms taking place in time-lapse of only some days.

Another well-known movie produced in the first decade of the New Millennium is *Al Gore*'s movie *An Inconvenient Truth* from 2006, a film documentary which "… aims to call attention to the dangers society faces from climate change, and suggests urgent actions that need to be taken immediately..." (Masters 2017). Although 50,000 free copies of the $19.99 DVD had been offered to the *National Science Teachers Association* (NSTA) for use of the film in US classrooms, the NSTA turned this offer down by the argument that the NSTA had a 2001 policy against "product endorsement" (Masters 2017).

In contrast, a recent, award-winning film documentary by Marijn Poels entitled "The Uncertainty Has Settled" shows the dangers of globalization along with climate politics causing radical changes such as farmers becoming energy suppliers and asks the question: "Are we doing the right thing?" (Sputnik 2017). Poels tries to increase public awareness about the negative effects of a too extensive and too rapid expansion of renewable energies, drawing people's attention to the fact that food supply is more important for the survival of humankind than energy supply, even if "green" energies are used (Sputnik 2017).

An over-exaggerated fear of CO_2 as possible main cause of Climate Change might produce similar results like Mao's *Great Sparrow Campaign* which marked the start of "…the greatest mass starvation in history…" (Platt 2013): in 1958, Mao ordered to kill all sparrows to protect the farms, declaring sparrows as pests because they ate grain. So, the Chinese killed hundreds of millions of sparrows. The consequences of this campaign became evident in 1960 because sparrows do not only eat grain seeds but also eat insects and – with the birds gone – insect populations boomed: locusts swarmed all over the country and ate everything they could find including crops. Scholars estimate that 45–87 million people died from starvation due to this environmentally and socially disastrous campaign (Platt 2013). Although Mao finally ordered an end of his sparrow-killing campaign, it took decades until the people, the environment, and the economy fully recovered (Pusa 2017).

This example illustrates what can happen if a generally useful naturally occurring thing, e.g., a living thing like useful animals or a naturally occurring useful gas like CO_2 is demonized. Misleading terms like "decarbonization" or "zero CO_2" have the potential to lure unsuspecting people into the erroneous belief that CO_2 was a noxious or even toxic gas which needed to be extremely reduced or even entirely eliminated. The application of these terms, however, has the general potential to cause a mass hysteria which might finally lead to a severe and long-lasting disturbance of the ecosystem, because CO_2 is "…not something 'foreign' to our bodies…" (Gettelman and Rood 2016), but "…part of the system, a critical part that is naturally all around us. We drink CO_2, we exhale it, and our bodies are made of carbon. Carbon is absorbed by plants with photosynthesis and used to build their tissues. So, CO_2 is not bad; it is a natural part of the system" (Gettelmann and Rood 2016). Thus, the term "decarbonization" would mean the end of all life on earth.

1.7 The Instrumentalization of the Climate Change Topic by Political Transformers and Its Potential Impacts on Global Politics and Society

Occasionally, parts of the media and the scientific world argue that only a global government along with a global police force might enforce "climate justice." Would this really be necessary for the greater good or might it rather open the door for abuse of power by a global authority and – in the worst case – possibly even lead to a global fascist dictatorship?

The suggestion to put a global policy in place had already been made in the comment of the COR's Executive Team on *The Limits to Growth* (King et al. 1972). King et al. state that:

> …the global issue of development is…closely interlinked with other global issues…The achievement of a harmonious state of global economic, social, and ecological equilibrium must be a joint venture based on joint conviction with benefits for all...the Club of Rome also will encourage the creation of a world forum where statesmen, policy-makers, and scientists can discuss the dangers and hopes for the future global system without the constraints of formal intergovernmental negotiation. (King et al. 1972)

This leads us back to *Conditions of World Order* as a possible precursor book for COR reports from the 1970s to 2015 which might have inspired the third book of this series, *Reshaping the International Order*, coordinated by Jan Tinbergen, one of the co-authors of *Conditions of World Order. Reshaping the International Order* puts a focus on "…development, distribution, and improved welfare that will require a good deal of economic growth…" (Tinbergen et al. 1976).

Conditions of World Order, influenced and co-authored by the controversial politician Henry Kissinger,[4] who has meanwhile been exposed by former counter-intelligence officers as an "avowed agent of British oligarchic interests ... in a 'multi-polar-world'" (Thompson 1982) and as an active member of subversive supra-national elitist circles (van der Reijden 2017; Thompson 1982; Day 2012), propagates the supposed "indispensability of World Order" (Jaguaribe 1968). Kissinger, who would later on support *Operation Gladio* and similar operations financially and personally as revealed by declassified secret service papers and other credible sources (Fleming 2017; van der Reijden 2013), argues that "…the ability to foment domestic unrest is a more potent weapon than traditional arms" and that many country leaders "…will be very sensitive to the threat of domestic upheaval… all states find themselves face to face with the necessity of avoiding a nuclear holocaust…a common task which technology will impose…Therefore, we must establish an international order before a crisis imposes it as a necessity" (Kissinger 1968).

[4] Kissinger who is known for statements like "The illegal we do immediately; the unconstitutional takes a little longer…" (NSA Archive 2012) is also accused of having jeopardized US efforts to stop mass killings by Argentina's 1976–1983 military dictatorship by congratulating the country's military leaders for "wiping out" terrorism, as shown by a large trove of newly declassified state department files" (Goñi 2016; CIA 2017).

The authors of *Conditions of World Order* discuss possible chances to reach this objective, including the possibility of using UN as police force for the World Order (Hoffmann et al. 1968) and expressing their regret that "…the unofficial conference of NATO parliaments could not evolve into a NATO parliamentary assembly…" (Van Benthem Van Den Bergh 1968). This might have allowed the United States and Europe to share competences in the fields of economics and defense (Van Benthem Van Den Bergh 1968). Anyway, Hoffmann states that the "...European experiment" (Hoffmann 1968) basically succeeded as the European states survived transformed, "...swept by the advent of the 'age of mass consumption'...caught in an apparently inexorable process of industrialization, urbanization, they become more alike in social structure, in economic, and social policies..." (Hoffmann 1968), whereas Tinbergen states that the UN and their specialized agencies were "...closest to a World Organization..." (Tinbergen 1968) including the *UN Organization for Industrial Development (UNOID)*, the *Food and Agricultural Organization (FAO)*, the *International Bank for Reconstruction and Development (IBRD)*, the *International Monetary Fund (IMF)*, and the *World Health Organization (WHO)*, a concept supported by Henry Kissinger who is often quoted with the words: "Who controls the food controls the people...he who controls the money, rules the world" (Mittelbach 2013).

In the food sector, the FAO/WHO-established *Codex Alimentarius*, "...a collection of standards, guidelines and codes of practice...by the Codex Alimentarius Commission...to protect consumer health..." (FAO 2017) is nowadays quite influential, but criticized by independent health experts for "having to do with wealth, not health" (Health Freedom USA 2017) by supporting the pesticide-, GM-, nanotechnology-, and pharma-lobby (Todhunter 2017; Byrne 2007; Dr. Rath Foundation 2005) and using public interest groups, funded by social engineering groups like the *Rockefeller Family Fund*, who are demonizing essential vitamins by deeply flawed, "media-ballyhooed" studies which can easily be refuted by experts from, e.g., Harvard Medical School (Byrne 2005). In the financial sector, the politicization of the IMF, claiming to promote "global economic stability" by helping "...countries implement sound and appropriate policies..." (IMF 2014), triggers criticism as "...'countries...involved with IMF loans...all fail!' "while other countries gain political power over them via the IMF, "... peddling ... the agenda of its strongest member ... over the needs of those it claims to help..." (Matsangou 2017). Experts from Stanford stated already after the Asian financial crisis from 1997 that the IMF as a "lender of last resort" facilitates situations of "moral hazard" arising if "an actor does not bear all the risks of his actions", recommending that the IMF should "... focus on being a capital provider...not a policy dictator..." (Moore et al. 1999).

In sum, Tinbergen calls for "…a more active role of the United Nations…" in the future development of international economic planning, while criticizing the UN's allegedly "weak construction" (Tinbergen 1968) and its "strong preference for national autonomy" (Tinbergen 1968). Meanwhile, Tinbergen's concept seems to have been partly implemented on a global base - at least in the food, health, and financial sectors; the plans of the team of authors who contributed to *Conditions of World Order,* however, do not stop here but go far beyond that.

Helio Jaguaribe, nowadays still actively involved in social-democratic projects, e.g., participating in political film documentaries (Jaguaribe 2017), describes the envisioned future *World Order* as follows:

> …Only the Authority is Sovereign and only it can legislate for the world in general and provide for the observance of its norms. The national states, and not the individual citizens of these states, are the subjects of the Supra-National Authority. The organs of the Authority are established not directly by the citizens of the national states, but by the states themselves. Representation of each state will probably not be merely proportional to its population, but will take into consideration other factors, such as total and *per capita* income, previous military power…. (Jaguaribe 1968)

Bestseller authors Glenn Beck and Harriet Parke might have had Jaguaribe's World Order concept in mind when they wrote the postapocalyptic thriller *Agenda 21,* whose commercial summary gives a descriptive insight into the dire scenarios of this thriller:

> Just a generation ago, this place was called America. Now, after the worldwide implementation of a UN-led program called Agenda 21, it's simply known as "the Republic." There is no president. No Congress. No Supreme Court. No freedom. There are only the Authorities.
>
> Citizens have two primary goals in the new Republic: to create clean energy and to create new human life…This … is all that eighteen-year-old Emmeline has ever known…Until the day they come for her mother...Emmeline begins to search for the truth. Why are all citizens confined to ubiquitous concrete living spaces? Why are Compounds guarded by Gatekeepers who track all movements? Why are food, water and energy rationed so strictly? And…why are babies taken from their mothers at birth? As Emmeline begins to understand the true objectives of Agenda 21 she realizes that she is up against far more than she ever thought. With the Authorities closing in, and nowhere to run, Emmeline embarks on an audacious plan to save her family and expose the Republic—but is she already too late?" (Beck and Parke 2013)

The thriller *Agenda 21* strongly reminds the concept of a World Order as the one described in *Conditions of World Order*, although the mutual threat of nuclear power as "common task" or "unifying element" to justify a new international order (Kissinger 1968) has been replaced by the threat of Climate Change. In real life, the *Agenda 21* (see above Sect. 1.3) and the *2030 Agenda for Sustainable Development* adopted at the *United Nations Sustainable Development Summit* on September 25, 2015, a "new universal Agenda" (UN 2017g) which seeks "…to build on the Millennium Development Goals and complete what these did not achieve…" (UN 2017g) seem to have noble objectives, but both are widely criticized.

Some consider the *2030 Agenda for Sustainable Development* a "…blueprint for the global enslavement of humanity under the boot of corporate masters…" (Adams 2015). Others consider it a "…perfect vehicle for the elite…to bring in their version of utopia, because…every possible form of human activity affects the environment in some way…" (Snyder 2015). Apparently, "…U.N. Agenda 21 has morphed into Agenda 2030 and now into Vision 2050, a plan to force 9 billion people to live by the globalists prescription of 'living well and within the planet's resources…" (Johnson 2015). *Vision 2050* reaped ironical remarks in the German newspaper *Die Welt* in an article entitled "Bis 2050 wird der 'Normalbürger' abgeschafft," i.e., "Until 2050 the 'normal citizen' will be abolished" (Maxeiner and Miersch 2011).

Jørgen Randers, one of the co-authors of *The Limits to Growth*, has even visions beyond 2050: in a COR report entitled *2052 A Global Forecast for the Next Forty Years*, Randers envisions "…impressive advances in resource efficiency, and an increasing focus on human well-being rather than on per capita income growth..." (Randers 2012) but predicts that "…future growth in population and GDP…will be constrained…by rapid fertility decline as result of increased urbanization, productivity decline as a result of social unrest, and continuing poverty among the poorest 2 billion world citizens…" (Randers 2012) and that "…runaway global warming, too, is likely…" (Randers 2012). Randers states that "…the world is small and fragile, and humanity is huge, dangerous, and powerful…", calling his daughter "...the most dangerous animal in the world..." (Randers 2012) who "…consumes between 10-30 times as many resources and generates 10-30 times as much pollutants as an Indian child…", encouraging birth controls in countries of the industrialized world (Randers 2012) and suggesting that - due to the urgency of mitigating Climate Change by CO_2 emissions - democracy should be replaced by an authoritarian style of government. Randers predicts a future in which people will not know nature and animals anymore, will not be able to travel anymore and where unrest will be suppressed by fighting robots (Randers 2012).

In another recent COR report entitled *Reinventing Prosperity*, co-authored by Jørgen Randers and Graeme Maxton, the authors identify "…persistent unemployment, widening income inequality, and accelerating climate change..." as "…most challenging problems of our time" (Randers and Maxton 2016), offering 13 "… politically feasible proposals to improve our world…" (Randers and Maxton 2016) including shortening the work year and raising the retirement age. The authors reaped derision and mockery for this book. The German newspaper *Die Zeit* headlined "Club of Rome: Die Welt auf die harte Tour retten" ("Club of Rome: Saving the World the Hard Way") and wrote: "In the brand new report to the Club of Rome, which Randers presented together with his Secretary General Graeme Maxton in Berlin, the co-authors are even more concrete. Any woman who is raising only one child should get a $ 80,000 bonus at the age of 50 for her renunciation…Such a rigorous state attack into one of the most private decisions of every individual citizen, and with a slippery financial incentive: this is not only unpopular but also ethically questionable" (Grefe 2016).

Enlightened and morally responsible modern scholars warn against the "fatal misconception" to consider deliberate depopulation as key measure "...to prevent poverty, hunger, ecological decay, and runaway climate change" (Butler 2009, with further references) or even to equate it "with the very survival of humanity" as "... the hardcore populationist lobby" ignores the fact that "...population growth is slowing worldwide", treats "...the victims of social and economic injustice as obstacles to a sustainable society..." and systematically devalues "...both the sanctity of life and the autonomy of the individual" (Butler 2009, with further references). In contrast, *The Limits to Growth, 2025, A Global Forecast for the Next Fourty Years*, and *Reinventing Prosperity* seem to be influenced by the outdated Malthusian Theory of Population. In his *Essay on the Principle of Population*, Malthus had proposed the principle that human populations grew allegedly exponentionally while food pro-

duction grew at an arithmetic rate (Weiss 2011). Unfortunately, Malthus' views were and still are occasionally misrepresented and abused by misanthropes to propagate targeted population reduction by wars, famine, and the deliberate creation of poor living and working conditions fostering disease and premature death of broad sections of the population (Weiss 2011), although Malthus never proposed such repressive measures but rather promoted universal education for the poor as well as late marriage, abstinence, and fewer children for everyone in favor of a higher standard of living, living himself according to these principles (Parikh 2009). Moreover, Malthus' views must be seen against the background of the time in which he lived (1766–1834), because Malthus could not foresee increases in agricultural production due to technical progress (Weiss 2011).

The 1991 COR report *The First Global Revolution. A Report by the Council of the Club of Rome*, the first report written by the COR itself, originally published by *Pantheon Books* on September 3, 1991, contains some misanthropic and extremist world views:

> …The collapse of communism in the Eastern European countries and the Soviet Union constitutes a major and unsettling factor ... the sudden absence of traditional adversaries has left governments and public opinion with a great void ... New enemies, therefore, have to be identified ... new weapons devised ...In searching for a new enemy to unite us, we came up with the idea that pollution, the threat of global warming, water shortages, famine ... would fit the bill. In their totality and in their interactions these phenomena constitute a common threat which demands the solidarity of all peoples ... All these dangers are caused by human intervention, and it is only through changed attitudes and behavior that they can be overcome. The real enemy then, is humanity itself. (King and Schneider 1991)

Unfortunately, such views – epecially if coupled with a call for "population policies" (King and Schneider 1991) – facilitate the occasional classification of climatology as an "ideology" or "religion" (McVeigh 2009). The Pope's interference into the Climate Change topic does not help either. As university-level theologist and trained chemistry technician (Vaticanradio 2013) who is no university-level scientist or engineer, the Pope was called "misguided" by climate scientists for calling Climate Change a "sin" at the World Day of Prayer for Creation in September 2016, stating that human-made Climate Change contributed "…to the heart-rending refugee crisis…" (Bentz 2016) and erroneously "…equating releases of CO2 into the atmosphere as a similar act of pollution as the release of more obvious and truly harmful toxic substances…" (Bentz 2016). The scientists noted that Pope Francis probably got "…terrible advice from some exalted churchmen who are seriously deficient in scientific knowledge" (Bentz 2016). Pope Francis' plan to deliver an encyclical on environmental challenges was criticized by the Catholic US presidential candidate *Rick Santorum*: "The church has gotten it wrong a few times on science…we probably are better off leaving science to the scientists" (Vale 2015).

In a modern democratic society, scientists should be able to do their research and their publications independently without any influence from influential church leaders, politicians, media, industrial lobbyists, or covert political transformers. Especially the Climate Change topic can be easily abused by persons and entities with vested interests. Some consider the Paris Agreement "…a massive transfer of

wealth that will have no impact on the climate ...calling attention to warming when the earth is clearly in a cooling phase…" (Corombos 2015). Tom Wigley, a globally respected climatologist, said: "If we introduce the Kyoto Protocol in its original form, that is every country reduced to the amounts that we want, nobody would be able to measure the difference…" (Corombos 2015). According to the climatologist Tim Ball, the true objective of the COP conferences including COP21 had been to establish the *Green Climate Fund*:

> …They decided that developed nations had developed by using fossil fuels and the fossil fuel byproduct, CO2, was causing climate change or initially global warming…Therefore, those 23 developed nations had to pay for their sins…to put money into a fund…to be distributed to the developing nations that were being punished or penalized by those developed nations…At COP 16, they introduced…the Green Climate Fund. That's what they were approving in Paris…a bank account set up in South Korea under the International Monetary Fund, at which all of these developed nations have to put money in to give out to the developing nations. (Corombos 2015)

Therefore, it is important to clarify in how far the Paris Agreement is legally binding (C2ES 2015) or not (Page 2015; Siciliano 2017; Resnick 2017). Already before COP21 in Paris, three countries (Russia, India, and China) had stated that the global warming science was a fraud. Those nations, who are skeptical, are "… poised to economically exploit those 'who are buying into the alleged threat'…" (Corombos 2015).

Nevertheless, such fraud schemes under the cloak of environmentalism should not deter political leaders, business people, and citizens from taking into consideration that fossil energies are indeed a limited resource, in addition to being environmentally rather harmful – at least due to their toxic combustion products like carbon monoxide (CO), nitrous gases (NOx), and sulfur dioxide (SO_2), and eventually also due to the enhanced greenhouse effect by the increased CO_2 levels in the atmosphere which might contribute to Climate Change (Schwarz-Herion 2015a, b, with further references). Therefore, the current trend toward a low-carbon economy has the potential to equally serve the social, ecological, and economic dimensions of SD, if the global civil society seeks the dialogue with the current power players in all fields and demands a higher level of transparency regarding climate science as well as the actual costs and environmental risks of infrastructure projects. In this case, the implementation of the *Sustainable Development Goals* might actually lead to a win-win situation for many stakeholders on a global base.

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