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Climate Change a Concern of Peace and Security: Relooking at Environmental Security

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Abstract

Climate change is an issue of global socio-economic, political and legal importance to governments and businesses across the world. Climate change has grave implication on lives and livelihoods by disturbing the biodiversity. It also causes great environmental concern, as it has the potential to directly pose threat to the primary needs of human society. It has also the potential to cause scarcity of natural resources, primarily due to the failure in demands, thus, resulting in environmental insecurity. Such a situation may act as risks to the stability of societies, leading to possible violent conflicts among them, while threatening human security. The paper highlights the problem of climate change through evidence based global projection of climate change indicators published in reports of various international bodies and research organisations and how the threats play a role of multiplier to environmental insecurity and the way forward and effective strategies to mitigate the global concern.

Keywords: Climate Change Environmental Security, Environmental Threats, Conflicts

Introduction

The planet Earth has resurfaced with a global challenge of climate change due to human activities. Since ages, around the world nation and states believes, that, the global climate change is a pressing concern. The direct impact of climate change phenomena is grave, as it will affect every human on the earth. Some noted ill effects of higher temperature are heat extremes, shift in heat patterns, including heat waves, widespread crop failure, shifts in animal and plant ranges, natural disasters, chronic droughts and economic instability. The most severe among such effects are depletion of natural resources and competition over natural resources, as it is directly leading to insecurity of water and food. This is asserted as one of the major cause that will see the future crisis and domestic conflicts as well as international repercussions. Moreover, climate change is an issue of global social, economic, political and legal importance to governments and businesses of the world. Although the effects of climate change are not uniform across the world hence the nation states are dealing with different types of environmental threats and have different policies. According to the United Nations Environment Programme (UNEP) there is an emerging global consensus that climate change will stress the economic, social and political systems that underpin each nation state. Further it says that institutions and governments are unable to manage this stress of the shocks of changing climate, the risks to the stability of a states and societies will increase. Climate change is ultimate threat multiplier aggravating already fragile situations and potentially contributing to further social tensions and upheaval. Climate change as threat multiplier of the environment

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arise the climate related insecurity, hence there is a need for focused attention and increased preparedness in dealing with this global concern that has implications for environmental security.

Enviromental Security

Environment and security are ambiguous in nature and can be understood in various forms depending upon the perspective.

General interpretation of these two words separately can be stated as follows, the environment refers to the biological, physical, and chemical components and systems necessary to sustain life. Security being interpreted as "freedom from risk and the threat of change for the worse".[3]

There are various interpretations of environmental security depends on how the environment and security are themselves understood. The concept of environmental security views ecological processes and natural resources as source or catalyst of conflicts, barriers or limits to human well-being or to mitigate or resolve the insecurity.

The concept of environmental security is subject to multiple interpretation, which can be broadly classified in six ways, such as,

- Environmental security as impacts of human activities on environment.
- Environmental security as the impact of military activities on the environment.
- Environmental change as a common security problem, in need of collective action.
- Environmental change as a threat to the nation's security.
- Environmental change with a potential to cause violent conflict.
- Environmental change as a risk to human security.[4]

Global Projections of Climate Change

Since the Industrial Revolution, Earth's climate has been changing fast. Human actions are the major factor promoting this intense pace. In particular, the massive use of fossil fuel (oil, charcoal, gas) releases a large amount of carbon dioxide (CO2) into the atmosphere, which concentrates, and warms the planet. So far, this climate change has not affected life on Earth too much. However, it is threatening the existence of several life forms that have to endure this climate change coupled with other human-induced changes (for example, deforestation). All these factors combined may soon affect humans, too. For instance, the availability of food may be drastically reduced.[5]

[3] CAMBRIDGE DICTIONARY, https://dictionary.cambridge.org/dictionary/english/security (last visited Nov. 10, 2021).

[4] J. Barnett, *Environmental Security*, INT. ENCY. OF HUMAN GEO. 553-557, (2009).

[5] Alex hubbe & Mark hubbe, *Current Climate Change and the Future of Life on the Planet*, (2019).

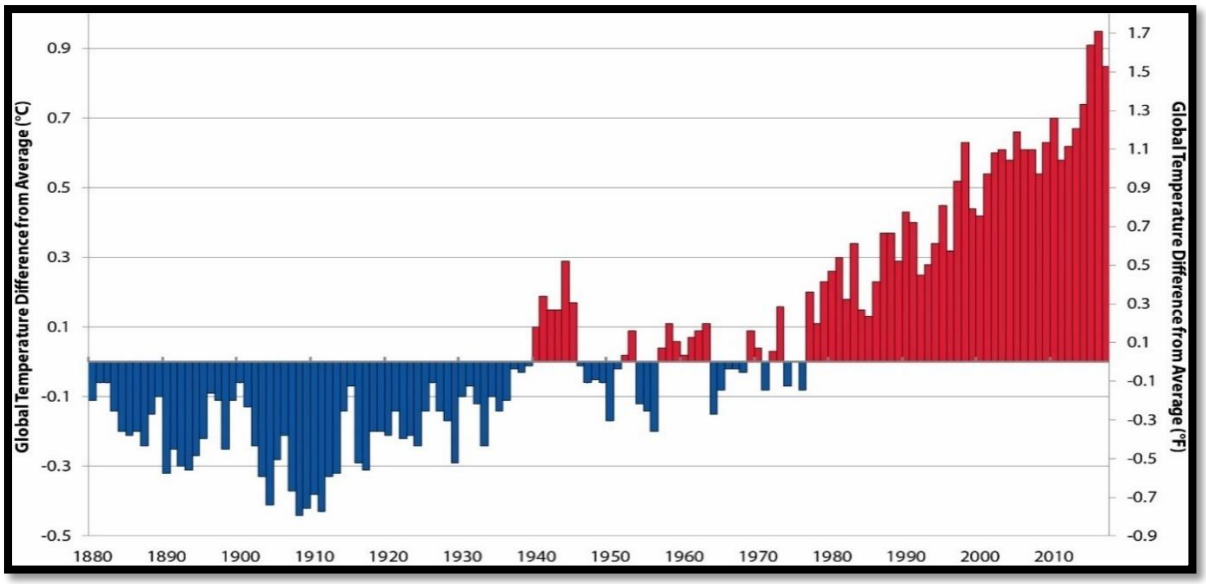

Fig 1: *Difference in average global temperature for each year from 1880 – 2016 compared to the 20th century average.*[6]

As per observations, since the year 1880, the average global surface temperatures has witnessed an increase of more than 1.5°F (0.8°C). The trend is similar for both land and the ocean, especially, since 1970s. The rise in the global average temperature from the beginning of the 19th century is reflected by the rise in the concentrations of the atmospheric carbon dioxide over the same time period as shown in Fig 2.

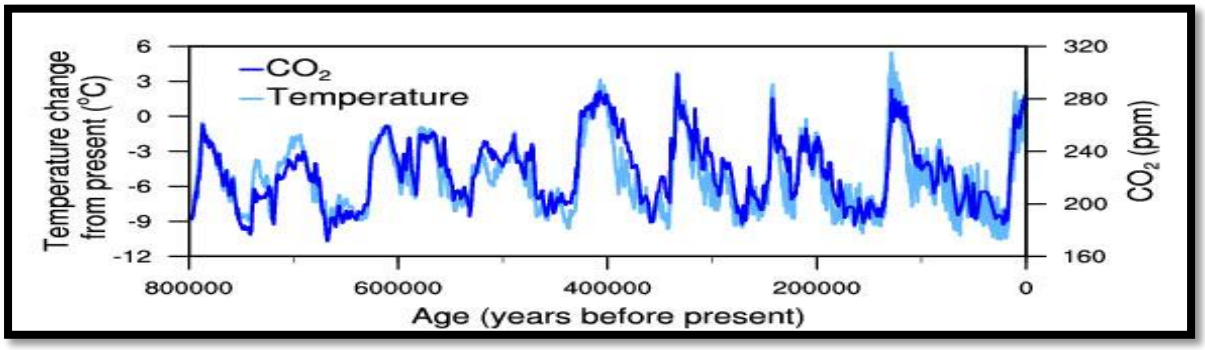

Fig 2: *Temperature change (light blue) and carbon dioxide change (dark blue) measured from the EPICA Dome C ice core in Antarctica* [7]

The average concentration of atmospheric carbon dioxide globally was 405 parts per million in 2017, this level of carbon dioxide in the atmosphere is approximately 45% higher than during any other warm period in the last 400,000 years. [8]

The year 2017 is the hottest ever non-El Nino year. The Arctic had its lowest ever February sea ice levels and is warming faster than anywhere else on the planet,

[6] NOAA National Centres for Environmental Information (NCEI). (Last visited Aug. 23, 2018).
[7] Jouzel & Lüthi (2007, 2008).
[8] Cassaundra Rose, *Present Day Climate Change, how do we know?* American Geosciences Institute, (Last visited Aug. 2018).

potentially disturbing the predictability of the Gulf Stream and jet streams.

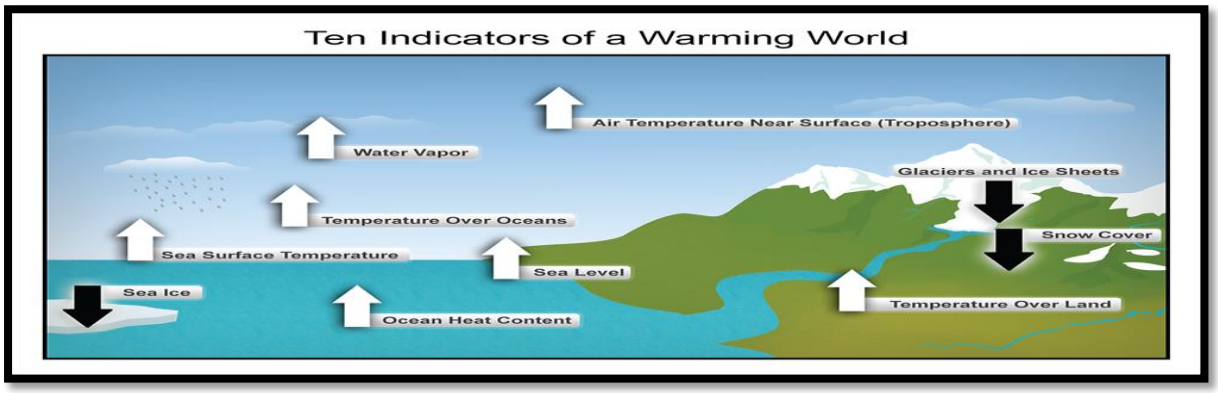

Fig 3: *(Indicators of a warming world, measured over the last century. National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Centre)*

Some other observations in terms of climate change as experienced in recent past, involves, 8 inches rise of global average sea level from the late 19th century; declining sea ice, ice sheet, and glacier size; changing patterns in rain and snowfall; decrease of snow cover and enhanced period of frost-free climate; along with greater frequency of having higher temperatures in recent in the recent decades. Contributing factors to sea level rise include the expansion of ocean water as it warms and the melting of glaciers and ice sheets. Satellite observations have suggested that the rate of sea level rise globally since 1992 has been twice as rapid as during the previous century. An additional side-effect from rising carbon dioxide concentrations is that the surface ocean has become approximately 30% more acidic since the late 19th century, which may have strong negative effects on sea life.

Natural processes significantly affect Earth's climate but there is strong evidence that greenhouse gas emissions from human activities, in association of other man made influences, like, changing pattern of land-use, are associated with rapid warming, as observed since mid-20th century. The ten warmest years from the time record-keeping began in 1880, have occurred since the early 21st century, and there are chances, that, the average global temperatures may also increase by 2°F to 11°F, over the next century, along with host of other changes in the Earth system. [9]

Geoscientists predict that the matters to go far worse if one doesn't act now on the reasons that are contributing to the climatic change which can have adverse effect on wildlife as well as on human life too.

Environmental Threats

"Environmental threats are the greatest risks we face"

When identifying the biggest threats to humanity, governments and businesses traditionally focus on such risks as conflict and war, economic crises, and breaches of cybersecurity. However, the latest World Economic Forum Global Risks Report again highlights that the continued deterioration of the global environment is increasingly dominant.

[9] Cassaundra Rose, *Present Day Climate change, how do we know?* AMERICAN GEOSCIENCES INSTITUTE, (Aug. 2018)

One of the biggest Environmental Threat is Climate Change, which has increased in terms of frequency and intensity, as manifested in the form of natural disasters, such as, droughts, wildfires, heat waves, rainstorms, tropical cyclone, and hurricanes. Now the question is what can be the effect of climate change on humans? As per an estimate of the World Health Organization (WHO), between 2030 and 2050, climate change may cause more than 250,000 additional mortality per year, especially due to rising incidences of malnutrition, vector borne diseases, gastro-intestinal diseases and heat waves. Human impacts include both the direct effects of extreme weather, leading to injury and loss of life, as well as indirect effects, such as undernutrition brought on by failures. Various infectious diseases are more easily transmitted in a warmer climate, such as dengue fever, which affects children most severely, and malaria. Young children are the most vulnerable to food shortages, and together with older people, to extreme heat. The WHO has classified human health impacts from climate change as the greatest threat to global health in the 21st century

The second biggest threat to environment is in the form of extinction of Species and loss of Biodiversity. In this regard, the Global Risks Report 2018 states that biodiversity loss due to species extinction is considered a risk not just for the environment but also the global economy. An alarming rate of species extinction is happening worldwide. The human induced rate of species loss is estimated to be around 1,000 to 10,000 times the normal rate, according to the World Wildlife Fund (WWF).

The third grave threat is in the form of air and water pollution, as it has been named as one of the prominent risks in the Global Risks Report 2018**.** Pollution has been the unwelcome by-product of industrial development in the past century. While there are nine kinds of pollution, air and water pollution have the most alarming consequences. This is followed by Water Crisis. The 2019 Chennai water crisis was a water crisis occurring in India, most notably in the city of Chennai in Tamil Nadu.[10] On 19 June 2019, Chennai city officials declared that "Day Zero", or the day when almost no water is left, had been reached, as all the four main reservoirs supplying water to the city had run dry. This particular scenario represents what can be the immediate future of the world if we continue to exploit our water resources. Next gravest threat to environment is the drain of the natural resources. This is because an ever-increasing global population may look like an obvious threat to the environment. But it is actually connected with the larger threat of consumption, whose complexity is much greater and directly connected to the dynamic of demand and supply.

Along with the above-mentioned threats, the impact of deforestation on natural environment is manyfold. Deforestation is the clearing, destroying, or otherwise removal of trees through deliberate, natural, or accidental means. It can occur in any area densely populated by trees and other plant life, but the majority of it is currently happening in the Amazon rainforest. Environmental Effects of Deforestation include loss of habitat,

[10] Murphy, Paul P, Mezzofiore, Gianluca "Chennai, India, is almost out of water. Satellite images show its nearly bone-dry reservoirs", June 20. 2019 CNN

increased greenhouse gases, water in the atmosphere, soil erosion and flooding, destruction of homelands

Along with deforestation, soil degradation is also a treat to our environment. Social erosion is mainly caused due to soil compaction and the application of agricultural chemicals. Soil erosion can happen due to wind or water, when the protective cover of forests and other vegetation is removed and the topsoil is lost. Soil compaction occurs in areas where the land is over-grazed. Soil destruction is caused by heavy tillage characteristic of industrial agriculture These threats cause the highest amount of damage to the environment and ultimately tip the equilibrium of the energy flow. There are multiple reasons that degrade environment over time. Humans need to recognize the extent to which they rely on the resources that the natural world provides.

Latest Global Reports on Environmental Threats and Its Implication on Humanity

The Global Risks Report 2018 warned how extreme events could disrupt food production and cause famines. The report focuses on multiple issues with respect to environmental risks such as Extreme weather events (extreme temperatures), biodiversity loss and pollution.[11] And in the report of 2016, it stated that 29.7 million hectares of forests were cut down. NASA confirms that the quantum of CO_2 levels in the atmosphere have seen an increasing trend in past 150 years (280 parts per million to 400 parts per million). Causes cited were the burning of fossil fuels, intensive agriculture and other human activities. [12]

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is to perform regular and timely assessments of knowledge on biodiversity and ecosystem services and their interlinkages at the global level. The overall scope of the assessment is to assess the status and trends with regard to biodiversity and ecosystem services, the impact of biodiversity and ecosystem services on human well-being and the effectiveness of responses, including the Strategic Plan and its Aichi Biodiversity Targets.

According to the report of the World Economic Forum (WEF), the top five risks by likelihood over the next decade are: extreme weather events like floods and storms; failure of climate change mitigation and adaptation; major natural disasters like earthquakes, tsunamis, volcanic eruptions and geomagnetic storms; major biodiversity losses and ecosystem collapse and human-made environmental damage and disasters.

The State of India's Environment Report 2020 [13]published by Down to Earth, stated that more people died around the globe due to extreme weather events in 2019. 18% more people died due to seven major extreme weather events in 2019 and most of them were in Asia and Africa, the SoE Report 2020 showed.

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[11] WEBFORUM, http://reports.weforum.org/global-risks-2018/global-risks-2018-fractures-fears-and-failures/ (Last visited Dec. 2021).

[12] https://climate.nasa.gov/causes/ (Last visited Dec. 2021)

[13] SoE Report 2020, https://www.cseindia.org/state-of-india-s-environment-2020-in-figures-10173 (Last visited Dec. 2021)

Environmental stress, i.e., global impacts of climate change, environmental degradation, resource depletion and depletion of the ozone layer and transboundary pollution, may lead to a conflict like situation, as the global change has the potential to impact societal value system. This is because different people value different things, which may have direct implications for the security of individual States; group of States and of the international community as a whole. The situation becomes grim, as the array of issues pose direct threat to the human security, thus, having the potential of disrupting lives and livelihood.

The dynamic nature of the changes experienced by the global society, it becomes likelier, that, climate change will act as a source of international conflict, especially over which country has the higher potential to influence the activities, considered as the causes of global change and which country will bear the costs of responding, and finally, the what will be the dispute settlement mechanisms.[14] It is considered, that, if massive amount of climate change, takes place due to the effects of human activities, it will have a devastating impact over the developing countries, due to lack of resources, needed to mitigate the situation.

If global climate change has the potential to create drought on a regional scale, it may lead to crop failure in the region. Such a situation can be averted by developing and adopting drought-resistant crops, as such crops may prevent crop failure, thus, breaking the connect between environmental change (drought) and famine. In a similar manner, ozone layer depletion has the potential to cause skin cancer, primarily, due to the exposure of humans to the harmful ultraviolet radiation. This can be avoided by limiting oneself from extreme exposure to sun, along with use of sunscreens over their skin, though such measures do not reduce the chances of depletion the ozone layer. Along with these, the tropical deforestation causes threats to the survival of species, due to the elimination of their habitats. Such as situation can be averted by creating forest preserves, where variety of species will have sufficient habitat to survive, though it will not contribute much to slow net deforestation.

Furthermore, implications on humanity include;

- More and more people will be living in water-stressed areas
- Increasing greenhouse gas emissions will result in a large overshoot of the "well-below-2°C" target of the Paris Agreement on climate change.[15]
- The rapid decline in biodiversity will continue.[16]

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[14] Global Environmental Change: Understanding the Human Dimensions,1992, https://www.tandfonline.com/doi/abs/10.1080/00139157.1992.9931463 (Last visited

[15] Iyer, United Nations Framework Convention on Climate Change [UNFCCC] 2015, https://unfccc.int/ (Last visited Dec. 10, 2021).

[16] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES] https://www.ipbes.net/ (Last visited Aug. 2021).

- Stressed food systems will continue to result in persistent malnorishment, affecting both human well-being and planetary health (Whitmee et al. 2015).

With resources being compromised and over population and extinction of species and disturbed food chain and non-conventional climate, nations can fight over the dominance of who will be in charge and use the left-over resources and it may also lead to violent conflict. One such example would be, India has increased its construction of hydropower projects on the Indus Basin's western rivers. These waters are allocated to Pakistan by the Indus Waters Treaty – though India is allowed to use them to develop dams and other hydropower projects that do not store any water. However, some Pakistanis take a different perspective, contending that India is "stealing" Pakistan's water. Such accusations become a security matter when they emanate from the likes of the Laskhar-e-Taiba (LeT), an anti-India militant group. The LeT has threatened to attack India in response to India's alleged water theft. This and other such issues pose a direct threat to the national security of India.

The security issues should, beside traditional political and military aspects, also include environmental issues. The significance of environmental security extends far beyond the environmental sector as such. Environmental degradation, resource depletion and natural disasters may have direct implications for the security of individual States, group of States and of the international community as a whole. scarcity of environmental resources is also a direct cause of conflict in the domestic situation or threat to internal security and peace, in other terms people will face more issues of meeting primary demands than other that will increase violent rages among the societies.

Way Forward

The relationships which exist between human systems and environmental systems are based on the theory of mutual causation, as any form of human responses towards global change, has the potential to change both systems. Let it be individual, regional, national or international each and every effort to undo the damage caused can tip the balance to equilibrium.

We need to research the relationship between human health and being and the environment and hold fair and democratic public deliberations, such as community forums, academic conferences, and legislative debates, involving participants with diverse cultural, socioeconomic, philosophic, and scientific perspectives and device plan of action to restore, and prevent damage.

The way forward involves a wide array of options, such as, stabilizing GHG emissions, reducing emissions by 2/3 by the year 2050; to improve energy conservation and efficiency; introducing new regulations, in terms of re-transportation and building codes; raising price of fossil fuels and establishing a carbon tax.

Other approach to handle the damage caused so far is policy approach, and further integrating resource considerations into security policy and planning. And Stronger incentives for using resource-efficient technologies and policies.

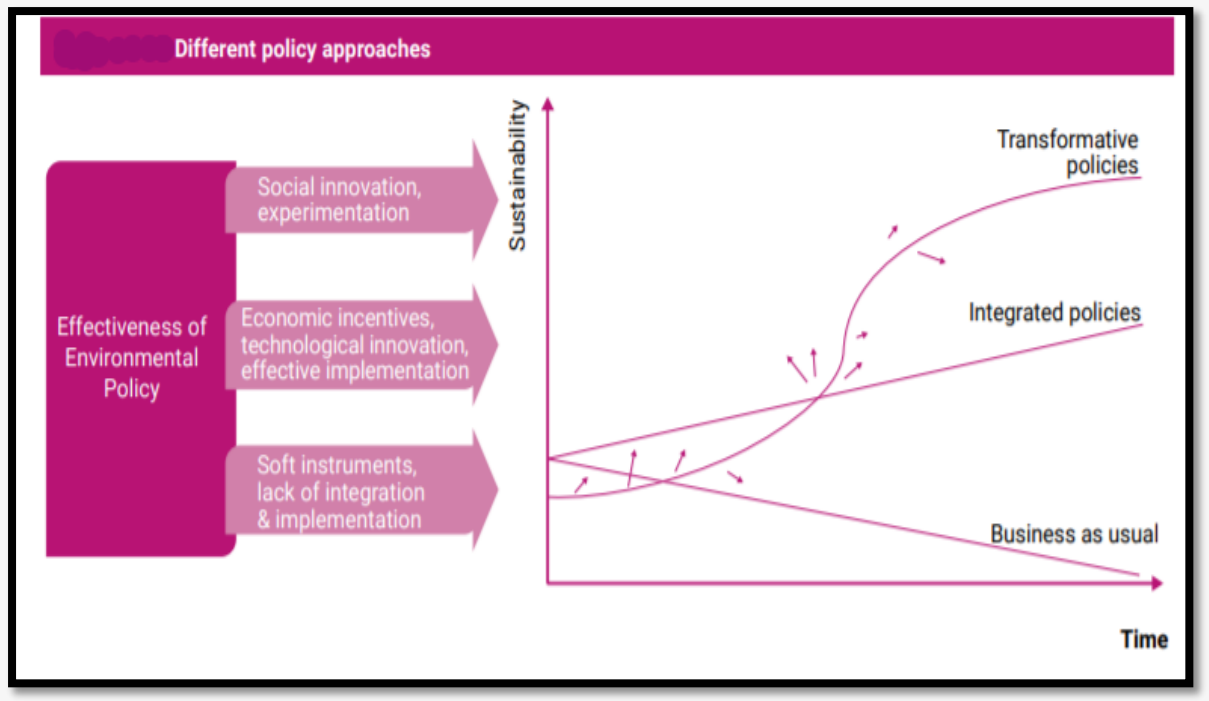

Fig 4: *Illustration of integrated transformative approaches*

The graphical image illustrates the sustainability trajectories for integrated and transformative approaches compared with business as usual. Business as usual, with unambitious environmental policies, lacks effective implementation and holistic integration in other sectoral policies and therefore will not contribute to safeguarding the environment and meeting the sustainable development goals. Stronger environmental policies, including those that provide economic incentives for reducing emissions and improving the efficiency of resource use, do have considerable potential. A transformative approach, based on experimentation and consideration of social practices may be more open-ended and less certain in its direction and chance of success, but it offers greater potential for higher impact and achieving sustainability goals. Both policy approaches could be pursued in parallel to ensure a greater chance of success in both the short and long term.

Five key approaches to guide, shape and enable transformation include, visions to guide systemic innovation towards sustainability; social and policy innovation; phasing out of unsustainable practices; policy experimentation; and engaging and enabling actors and stakeholders.

There is no simple recipe for enabling transformative change towards sustainability, but recent methodological innovations emphasize the need for different actors to come together and to experiment with innovations that have the potential for systemic transformation

And to achieve environmental security, it requires support action in the areas of education, training and exchange of information, along with enhancement of national

and international law. This would be best achieved through defining eco-geographical regions and international institutions.[17]

Implementing Effective Policies

According to the Inter-governmental Panel on Climate Change (IPCC), to keep the global warming below 2^0 Celsius, the emissions of carbon dioxide (CO2) and other greenhouse gases (GHGs) must be reduced by 2050 (compared to 1990 levels). Importantly developed countries will need to reduce the missions between 80% to 95% by 2050, along with advanced developing countries. In December 2015, 195 states around the world signed the Paris Agreement, which is an important pact produced at the 21st session of the Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) pledged for international cooperation on tackling climate change, some countries have working on it, but the process is very slow. Few countries have taken proactive legal steps towards mitigation of climate change risks through enforcing legislations;

New Zealand – has enacted emissions target legislation aiming to eliminate carbon emissions by 2050. The law commits to achieve net-zero carbon emissions by 2050 also reduction of methane emissions in the range of 24% to 47% in the same period.

The United Kingdom – introduced the Climate Change Act 2008, an amendment was made in 2019, it states commitment to achieve net zero carbon emission by 2050, the act was first of its kind the world. According to the act the government publish a climate change risk assessment every five years and develop a national adaptation programme to respond the to the highlighted risk assessment.

Sweden – has also enacted the Climate Act 2017 that is a part of climate policy framework aims at net zero domestic greenhouse emissions by 2045.

Conclusion

The changes needed to ensure a Healthy Planet, Healthy People are on such a scale and are so complex and extensive that it would be presumptuous to claim that they could be foreseen in full. Nevertheless, investing in the global environment, development and human health through multilateral agreements and actions, and building the wide coalitions that are necessary for transformative change, are certainly elements of an effective path to holistically addressing these transboundary challenges. The theme of Healthy Planet, Healthy People embodies this integrated approach to the contemporary environment and to addressing the socio-economic and health challenges faced by current and future generations wanting a sustainable planet for themselves, their children and for all life on Earth.

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[17] Frantzeskaki, N., Wittmayer, J. and Loorbach, D., *The role of partnerships in 'realising' urban sustainability in Rotterdam's City Ports Area, The Netherlands*, JOUR. OF CLEANER PROD. 65, 406- 417, https://doi.org/10.1016/j.jclepro.2013.09.023, (2018) (Last visited Dec. 15, 2021).