



DISCUSSION PAPER

A Short-Term Assessment of Global Climate Change: Impacts and Policy Recommendations

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Introduction

Although discussing the short-term effects of global climate change is still an 'Inconvenient Truth' for many, the fact that the level of atmospheric CO₂ has reached 415.01 ppm according to the last NOAA measurement shows that we are facing an alarming situation. The experience of institutionalization of climate change governance has become promising since 1992 when countries agreed upon the human-induced character of the problem and signed the United Nations Framework Convention on Climate Change (UNFCCC). In the following years, signatory parties showed a considerable effort to comply with the principles and requirements promulgated by consecutive COPs. However, the institutional dimension of international climate change governance remained protracted because of the very incompatibility between emission targets and economic interests of the parties which are predominantly shaped by business actors and lobbyists. Moreover, the unequal distribution of burden paved the way for a free-rider problem that perpetuated the protracted nature of climate change governance. Currently, we are faced with a set of negative effects of this unresolved issue in many terms. Global climate change is progressing even faster than in previous decades and manifesting itself with concrete short-term effects. Increasing frequency of extreme weather events such as hurricanes, drastic changes in precipitation trends, a decline in agricultural productivity due to the desertification of certain vulnerable regions, and the cumulative effects of these factors on food security are some of the basic short-term influences of climate change that we

see today. This discussion paper seeks to examine some of the short-term effects of climate change and offer some policy tools that should be urgently implemented. In general terms, we can divide the short-term impacts of climate change into two main categories: (1) direct environmental impacts and (2) direct impacts on human life. Since global climate change has a high degree of issue-linkage, these two categories are deeply intertwined so that impacts of climate change in a particular area directly affect others. Thus, what we see is kind of a growing complexity day by day. For the policy-making aspect, the urgent policy tools to deal with the issue are actually profound. The first goal is to increase the quantity and quality of scientific studies in order to assess the causal weight of climate change on the short-term effects primarily because there is still no genuine consensus amongst both the public and the scientific community about the causal relationship between some short-term extreme weather events and global climate change. Subsequently, governments should take specific and targeted action with a view of raising awareness amongst their populations to promote a better understanding of the urgency and severity of the issue. Moreover, sustainable development technologies should be prioritized in developing economic development strategies and clean development mechanisms (CDMs) should be implemented in line with an elaborate reconsideration regarding the overall assessment of the emission trading system. The focus of this paper will be on enumerating potential short-term impacts as well as policy initiatives designed to mitigate their negative effects.

¹ 'An Inconvenient Truth' is a 2006 American documentary on global warming, directed by Davis Guggenheim. The documentary was effectively used in line with the former U.S. Vice President Al Gore's educative project regarding global warming and aimed at increasing public awareness.

² For a detailed graphical illustration of the monthly average CO₂ trends, see <https://gml.noaa.gov/ccgg/trends/>

Short-term impacts of global climate change

Direct Environmental Impacts

The short-termism of governments has been one of the fundamental barriers to developing efficient policies to attain Nationally Determined Contributions (NDCs). In other words, parties to the UNFCCC have mostly relied on the illusion that the deteriorating effects of global climate change have to do with the unforeseeable future, not the short term. However, many examples illustrate how global climate change produces serious effects in the short term.

Increased Frequency of Extreme Weather Events

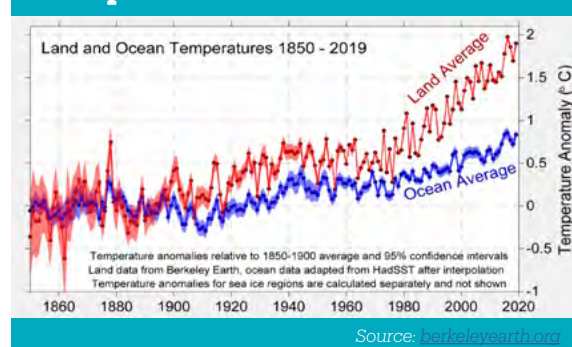
With the continuous increase in the amount of atmospheric CO₂, the frequency of extreme weather events has significantly increased. Tornadoes, hurricanes, floods, and hailstorms are some of the major extreme weather events that we began to observe frequently in line with increasing trends in global warming. Global climate change not only leads to the increase in the frequency of such extremes but also increases their severity. For the past two decades, the United States has been hit by hurricanes that have caused unprecedented economic damage. For instance, in 2005 the damage from Hurricane Katrina totalled some \$170 billion, while Hurricane Harvey in 2017 cost \$131 billion to the American economy³. Extreme weather events are complex meteorological processes including several variables that aggregately produce such outcomes. However, a calculation of average temperatures across different periods revealed that global warming trends significantly increases the possibility of extreme weather events.⁴ The rise of land and ocean surface temperature is also a major source of correlation in the relationship between global climate change and tropical cyclones, thereby elevating the risk of storms.⁵ Since the causation between climate

change and extreme weather events is hard to establish, [Carbon Brief](#) provides quite a useful tool of analysis for the global climate change-related extreme weather events around the globe in line with a scientific explanation about the correlation.

Change in Precipitation Regimes

With the increase in the temperature of the ocean surface, significant changes are expected to be observed in the Icelandic Low-Pressure System. Low-pressure areas, which are strengthened due to warming in the Atlantic, cause anomalies in the precipitation regime in Europe in the short run.⁶ Moreover, the uneven rise in surface temperatures is likely to increase the severity of hailstorms, causing even daily life damages as we began to observe frequently in the past two decades.⁷ It is possible to say that the change in precipitation regimes is also noticeable among the public. The fact that older generations say that there are no longer 'real' winters or that there are shifts in the annual characteristics of seasons are important indicators in the context of the public awareness of the short-term impacts of global climate change on the precipitation regimes.

Graph 1: Land and Ocean Temperatures 1850-2019



Source: berkeleyearth.org

³ For a detailed map and more information about the billion-dollar extreme weather events in the U.S between 2000-2021, see <https://www.c2es.org/content/extreme-weather-and-climate-change/>

⁴ To access the full content, https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf

⁵ Knutson, T., Camargo, S. J., Chan, J. C. L., Emanuel, K., Ho, C., Kossin, J., Mohapatra, M., Satoh, M., Sugi, M., Walsh, K., & Wu, L. (2020). Tropical Cyclones and Climate Change Assessment: Part II: Projected Response to Anthropogenic Warming. Bulletin of the American Meteorological Society, 101(3), E303-E322. Retrieved Dec 14, 2021, from <https://journals.ametsoc.org/view/journals/bams/101/3/bams-d-18-01941.xml>

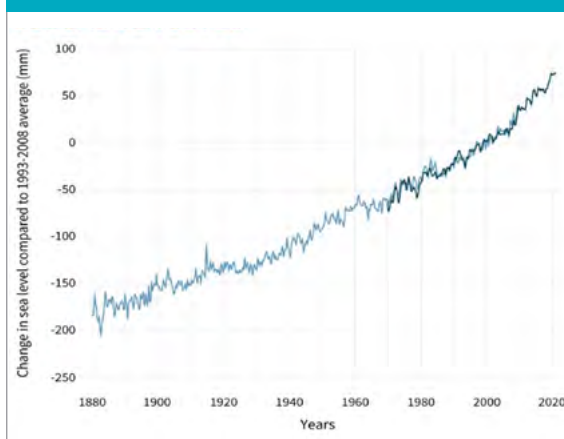
⁶ To access the full version of the report, see <https://www.eea.europa.eu/highlights/climate-change-poses-increasingly-severe>

⁷ Raupach, T.H., Martius, O., Allen, J.T. et al. The effects of climate change on hailstorms. Nat Rev Earth Environ 2, 213–226 (2021). <https://doi.org/10.1038/s43017-020-00133-9>

Melting Glaciers

One of the most frequently cited short-term impacts of global climate change is the melting of glaciers, which has also a broad scope of further implications for the rise in global sea levels. As an easily observable impact with the aid of satellite data, melting glaciers produce a domino effect in the Arctic region and significantly change the ice dynamics by making them more fragile over time.⁸ It has been stated that the melting of the Greenland glacier alone corresponds to 20% of the total rise in sea level between 2003-2021, which is a huge potential threat for continental Europe in the foreseeable future.⁹ Although most scientific predictions of glacier melting are seen in the context of long-term effects, this effect should be considered in the category of short-term effects in terms of observability and irreversible losses. For the effects of global climate change, the time factor does not show linear continuity. In other words, short term effects have the potential to produce unexpected effects earlier than expected. For instance, depending on the seasonal estimates of overtemperature in 2022, the degree of melting in the Arctic is difficult. Given this, procrastination could prove costly.

Graph 2: Global Sea Levels



Source: climate.gov

To see which areas are expected to be submerged in accordance with sea-level rise, Climate Central prepared an interactive map demonstrating the threat rising sea levels present to communities around the world. However unimaginable it may seem at first, it is the prospective global reality that we must consider its severity as soon as possible.



Antarctica: The White Continent (Özge Elif Kızıl - Anadolu Agency)

⁸ For the full version of the article, see <https://news.harvard.edu/gazette/story/2021/09/melting-of-polar-ice-shifting-earth-itself-not-just-sea-levels/>

⁹ For more detail, see <https://www.worldwildlife.org/pages/why-are-glaciers-and-sea-ice-melting>

Soil Degradation

One of the short-term impacts of climate change is soil degradation. Together with the extreme weather events, including excessive precipitation and floods, soil moisture significantly increases and dissolves fundamental minerals necessary for soil integrity. Due to the asymmetric distribution of climate change impacts on earth, it is also possible to see a reverse scenario in which overtemperature can significantly decrease soil moisture. Both scenarios eventually lead to serious soil degradation. Extreme weather events also increase the possibility of catastrophic events such as erosion.¹⁰ Unlike the long-term estimates regarding desertification, rapid changes in soil structure are quite easily observable and have a direct impact on agricultural productivity with the potential to severely affect global food security. Moreover, with increasing soil degradation, the overall capacity of soil to capture CO₂ is adversely affected.¹¹

Increasing Frequency of Wildfires

One of the most obvious environmental impacts of climate change in the short term is the increasing frequency of wildfires. While human-induced reasons also lead to wildfires, we do see an increasing correlation between global climate change and increasing frequency or damage. With global warming, considerable increases in air temperature are observable, creating warmer and drier air conditions, which are conducive to increasing the risk and duration of wildfires. In the short-term, global climate change not only increases the frequency of wildfires but also impacts their size, severity and duration. According to the 2019 IPCC report, the destructiveness and frequency of forest fires are highly correlated with climate change¹². Between 1984-2015, the number of wildfires in the U.S doubled and increased in intensity. This uptick is significantly correlated to drier forest beds associated with the impacts of climate change.¹³ A recent study also shows that a 1°C increase in air temperature caused a 19-22% increase in the wildfire risk in the Sierra Nevada between 2001-2021.¹⁴ These

records clearly show the very link between climate change and the frequency of wildfires. Moreover, greenhouse gas emissions increase during a wildfire so that it becomes both a cause and effect of global climate change. Considering the uneven catastrophic impacts of wildfires not only on air but also biological diversity, this issue deserves more scientific and public attention now.

Direct Impacts on Human Life

It is an obvious fact that all the afore-mentioned short-term environmental impacts of climate change also have severe consequences on human life due to the issue-linkage character of the problem at stake. However, the primary concern here is to focus on how climate change directly affects our daily life in terms of global food security in the short term.

Challenges to Agricultural Productivity and Food Security

Agricultural productivity is adversely affected by extreme weather events and soil degradation, the frequencies of which are on the increase in the short term due to climate change. However, the global distribution of agricultural impacts of climate change is asymmetrical. While high latitudes are positively affected (at least in the short term) by climate change due to the increase in air temperature which was not the case before, low latitude areas such as Pakistan and India are negatively affected by the excessive air temperature and associated side effects that serve to devastate soil quality¹⁵. For instance, Tom Newham, the vineyard instructor at Plumpton College, a UK college focused on land-based subjects, said that it was previously unthinkable to grow grapes in the UK, however, with the changing conditions they can now do that.¹⁶

Tropic, subtropic, and sub-Saharan regions are the most vulnerable in terms of the negative short-term impacts of climate change on agricultural productivity and food accession. As a result of this unequal distribution

¹⁰ Climate change and soil degradation including erosion risks are comprehensively discussed in a 2020 IPCC report. See https://www.ipcc.ch/site/assets/uploads/sites/4/2020/02/SPM_Updated-Jan20.pdf

¹¹ For a detailed report, see <https://www.eea.europa.eu/signals/signals-2019-content-list/articles/soil-land-and-climate-change>

¹² To access the full report, https://www.ipcc.ch/site/assets/uploads/sites/4/2021/07/05_Chapter-2-V6.pdf

¹³ To see more information and statistical data, <https://www.c2es.org/content/wildfires-and-climate-change/>

¹⁴ Gutierrez, A. A., Hantson, S., Langenbrunner, B., Chen, B., Jin, Y., Goulden, M. L., & Randerson, J. T. (2021). Wildfire response to changing daily temperature extremes in California's Sierra Nevada. *Science advances*, 7(47), eabe6417. <https://doi.org/10.1126/sciadv.abe6417>

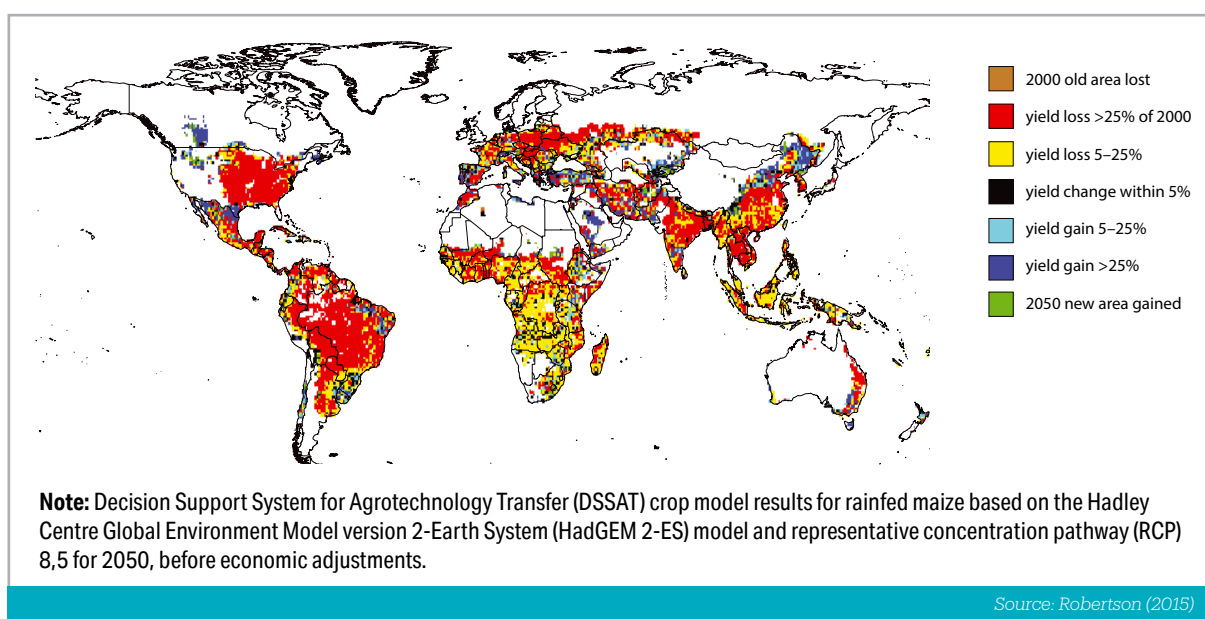
¹⁵ Uleberg, E., Hanssen-Bauer, I., van Oort, B. et al. Impact of climate change on agriculture in Northern Norway and potential strategies for adaptation. *Climatic Change* 122, 27–39 (2014).

¹⁶ For the full version of NBC news on this issue, see <https://www.nbcnews.com/news/world/climate-change-makes-england-s-vineyards-perfect-sparkling-wine-n962606>

of climate change impacts, regional disparities in agricultural production and overall productivity intensify rapidly. In the short term, global climate change deteriorates food security, the term that implies accessibility, availability, utilization, and stability of food that is biologically necessary for humans¹⁷. Short-term extremes such as excessive precipitation, higher air temperatures, and floods are some of the major factors that sharply diminish crop yields and pave the way for further problems regarding food security, particularly in low-income countries geographically located in the most vulnerable regions. In this context, it would be useful to examine in detail the effects of short-term and medium-term climate change impacts on food security through the example of Sub-Saharan Africa. According to the 2017 UN demographic projections, the population is expected to exceed 2 billion by 2050. Over this same period, it is predicted that there will be serious decreases in the yield of basic grain products, especially maize and wheat, together with decreasing precipitation due to global climate change¹⁸. The asymmetrical distribution of short-term and medium-term effects of climate change may be exacerbated by various side effects, as seen in the example of Sub-Saharan Africa, and make food security even more precarious. The fact that Africa as whole accounts for only 2-3% of the total global carbon emissions and is the continent that is expected to be most affected by

climate change, makes the situation all the more tragic. Despite the fact that the Global North has the main responsibility in terms of total greenhouse emissions, it has failed to produce a viable solution to tackle food security issues in Africa, one of the most impacted regions by climate change with the least responsibility. Therefore, growing concerns about food security in Africa, aggravated by increasing GHG emissions of major polluters, has gained an ethical that necessitates a rethink of common but differentiated responsibilities towards other parts of the world negatively affected by the economic interests of developed countries.

The map below shows the global distribution trends of maize yields in relation to climate change (i.e. to what extent global climate change has affected maize yields around the world). As seen, sub-Saharan Africa is represented mostly with red and yellow colours, demonstrating >5% or >25% yield losses compared to the year 2000 levels. In addition to the African case, Latin America's decreasing yield trend also deserves attention primarily because of its large agricultural export capacity. While the asymmetrical distribution of short-term impacts of climate change on agriculture will prospectively deepen the problem of food security in Africa, it will lead to other problems such as economic losses in different regions whose economies rely on agricultural production and agricultural exports.



¹⁷ This is the definition used in a 2006 Policy Brief by the FAO. To see the full version: https://www.fao.org/fileadmin/templates/faotail/documents/pdf/pdf_Food_Security_Concept_Note.pdf

¹⁸ To see the full version of the book chapter about climate change-related challenges to food security in Africa, <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/131459/filename/131662.pdf>



Turkish Red Crescent in Somalia. (Sadak Mohamed - Anadolu Agency)

Short-term policy recommendations

After addressing some of the short-term problems caused by global climate change, it would be appropriate to explain what kind of policy tools can be effective in the short term. At this point, it is important to underline the concept of short-term because if authorities become reluctant in determining and implementing short term policies and a pattern of irresponsibility based on economic interests is followed (as we see since the UNFCCC in 1992 and following COPs), it is highly possible to see the realization of long-term estimates. The world has already lost the chance to stop climate change. The main issue is to focus on mitigation from now on, manage the process efficiently and provide the necessary future adaptations that minimize the damage as much as possible.

Broadening the Participation of Epistemic Communities

Epistemic communities are essential parts of international climate change governance. The continuous scientific endeavours of the Intergovernmental Panel on Climate Change (IPCC) were a major factor that significantly accelerated the process of international institutionalization that started with the drafting of the United Nations Framework Convention on Climate Change (UNFCCC) and broad acceptance of the human-induced character of climate change in 1992. The consecutive IPCC reports brought dynamism into the process by demonstrating the severity of the issue and have continued in this

same direction until today. However, together with the uneven impacts of climate change, it has become structurally impossible for a single scientific body to study all regions. Instead, some additional scientific research platforms that are specialized in particular regions and particular impacts of the global change should be included.

Since global climate change manifests asymmetrically around the world, what is needed is the formation of regional epistemic communities specialized in a particular aspect of the issue in their home country or region and their integration in the decision-making process. For instance, the [European Environment Agency \(EEA\)](#), which was established as a functional body of the European Union in 1994, carries out scientific observation-based studies in the fight against climate change by strengthening the information exchange with national authorities, academics, NGOs and business communities. We see similar institutional design plans that focus on the national-level assessment of climate change impacts with a participatory strategy in Turkey. For instance, [The Final Declaration on Combating Climate Change](#), published by the Ministry of Environment and Urbanization of the Republic of Turkey in 2021 included provisions establishing the National Climate Change Platform and the National Climate Change Research Centre, demonstrating that institutionalization steps with participatory norms will be among Turkey's strategies. This represents an effective approach to promote the foundation of new research institutes and platforms that focus primarily on climate change impacts on Turkey and a potential model for other jurisdictions interested in localizing understandings of climate change impacts.

One of the most important reasons for broadening the participation of epistemic communities and establishing new ones is the fact that scientific studies on causality remain inadequate regarding many of the short-term effects, meaning that the major task of the existing epistemic communities should be the improvement of scientific explanations that are able to prove more strongly the causal relationship between climate change and observable impacts. In addition to global-scale studies, it is important to focus on scientific studies that elaborately reveal some of the short-term local changes related to agriculture and meteorology in order to eliminate any uncertainties about causality. Increasing epistemic communities

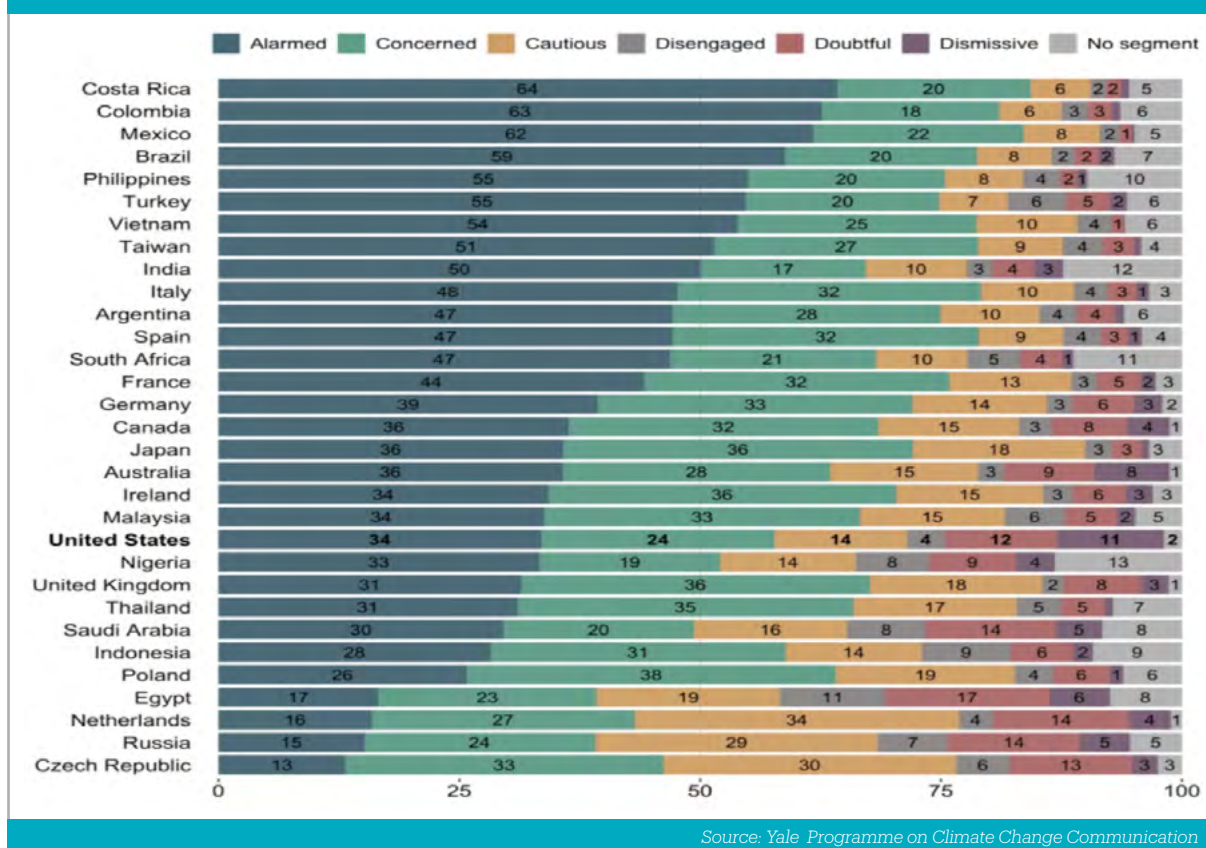
and research institutions focused on the impacts of climate change have the potential to provide effective mechanisms for understanding local or regional changes associated with climate change. In other words, vertical expansion of the epistemic communities specialized in particular areas of influence can bring effective results to deal with short term impacts. In addition, supporting scientific projects and studies on climate change with government incentives through subsidies and discussion panels can increase the interest in the subject in the intellectual arena, thereby expanding information networks. For instance, [the iklimBU](#) research centre at Boğaziçi University has been contributing to the scientific dimension of the issue through the issuing of comprehensive reports, lecture series and conferences, as well as providing useful climate modelling specific to Turkey since 2014. Supporting the number of research centres in academia will increase scientific knowledge about the local effects of climate change in the short term and offer new ways to utilize the information for the purpose of policy-making.

Raising Public Awareness

In addition to epistemic communities and research centres that are shaped by participatory norms in decision-making processes and specialize in local or regional studies, one of the most important solution mechanisms has to do with public awareness. In the age of post-truth, it is often the case that certain public figures, even a former U.S. President, deny the existence of climate change and describe the whole scientific endeavour proving the human-induced climate change as a 'Chinese hoax', among other descriptors. Interestingly enough, we see public demonstrations and protest movements advocating climate change denial in many countries, especially in the U.S. For instance, according to a study examining the discourse of conservative think tanks in the U.S., there are certain active organizations that publicly declare the denial of climate change and carry out public demonstrations against setting GHG emission targets.¹⁹

¹⁹ Boussalis, C., & Coan, T.G. (2016). Text-mining the signals of climate change doubt. *Global Environmental Change-human and Policy Dimensions*, 36, 89-100.

Graph 3: Six climate change audiences



Source: Yale Programme on Climate Change Communication

Graph 3 shows six types of climate change audiences in 31 countries in terms of the degree to which they consider the issue as urgent²⁰. While most countries have publics that are aware of the problem, there are still some significant gaps that need to be eliminated by raising public awareness. Policy recommendations in the context of raising public awareness require us to transform scientific studies on both the short term and long-term effects of global climate change to a level that can be understood by all segments of society. For instance, it is a very important initial step to simplify the concepts and data in scientific terminology on the subject, such as GHG emission and ozone depletion, and to explain them to the public through mass media and social media channels in a regular fashion. Also, general directorates of meteorological services should proliferate their online content and products such as mobile applications of daily weather forecasts to imbue users with certain easily understandable indicators or visual illustrations of the short-term impacts of climate change on a regular basis.

Moreover, it is an important step to instil a retrospective awareness in students by giving due importance to the subject in the curriculum by explaining the historical background of international institutionalization in the fight against climate change. Such a step is particularly necessary when we consider the fact that the large-scale losses in the long term will have the most impact on future generations. The fact that previous generations did not learn these subjects in primary school or beyond is arguably among the most important reasons for the widespread misunderstanding of the degree of urgency regarding climate change.

For local and regional public awareness projects, the main focus should be on raising awareness among those in the agricultural sector. In this context, introducing approaches to 'sustainable agriculture' could prove significant, particularly considering the fact that inefficient irrigation techniques can significantly multiply the short-term effects of climate change in regions prone to desertification. For instance,

²⁰ To see more data visualizations about the public perception of global climate change, <https://climatecommunication.yale.edu/visualizations-data/ycom-us/100>.

in recent years such risks have reached serious levels in Central Anatolia and the Salt Lake region in Turkey. The increasing risk of desertification in Central Anatolia, considered Turkey's breadbasket, could ultimately become irreversible through problematic agricultural practices, particularly widely used irrigation techniques that quickly deplete surface and underground water resources and seed selection. A useful policy should be one that explains the prospective challenges in the vulnerable regions having the risk of desertification as in the case of the Salt Lake region and should provide farmers with comprehensive guidance in their traditional agricultural practices that can yield inefficiencies and multiply the short-term effects of climate change.

For local and regional public awareness projects, the main focus should be on raising awareness among those in the agricultural sector. In this context, introducing approaches to 'sustainable agriculture'²¹ could prove significant, particularly considering the fact that inefficient irrigation techniques can significantly multiply the short-term effects of climate change in regions prone to desertification. For instance, in recent years such risks have reached serious levels in Central Anatolia and the Salt Lake region in Turkey²². The increasing risk of desertification in Central Anatolia, considered Turkey's breadbasket, could ultimately become irreversible through problematic agricultural practices, particularly widely used irrigation techniques that quickly deplete surface and underground water resources and seed selection. A useful policy should be one that explains the prospective challenges in the vulnerable regions having the risk of desertification as in the case of the Salt Lake region and should provide farmers with comprehensive guidance in their traditional agricultural practices that can yield inefficiencies and multiply the short-term effects of climate change.

In addition to vulnerable regions in which agricultural activities are based on inefficient techniques, the integration of local communities and indigenous peoples into the global climate change fight should have a central place in the policy-making process. It was considered first by the UNFCCC as a necessary policy. Subsequently, a relevant platform was established

for this purpose, namely, the Local Communities and Indigenous Peoples Platform. It is important to examine the local and regional reflections of the climate change problem by establishing similar organizations that follow inclusive patterns and agendas.

Sustainable Development Strategies

One of the short-term solution mechanisms for global climate change is to prioritize sustainable development strategies in the economic planning of countries. Clean development mechanisms (CDMs) and emissions trading systems, which were discussed in detail for the first time in the 1997 Kyoto Protocol, enabled developing countries to enter the emission target setting process with a degree of flexibility. The notion of 'sustainable development' started to gain popularity during the 1980s following consecutive UN reports that made reference to the concept. Moreover, the international climate change regime under the UNFCCC frequently used the concept in articulating solutions to the climate crisis. It envisages the follow-up of these economic policies, encouraging investments that keep carbon emissions low, and providing contributions to reduce carbon emissions to existing investments. The most important applications of sustainable and clean development strategies in the energy sector can be attained by the widespread use of renewable energy sources. However, it is not an easy transformation that can be quickly implemented by all. For instance, India's insistence (also supported by China) on switching the language to 'phasing down' the use of coal as opposed to 'phasing out' during the COP26 clearly shows that countries whose economies are coal-reliant are not eager to adopt such a transformation in the short-run. For this reason, epistemic communities play a major role in providing the necessary scientific knowledge base to assist coal-dependent economies such as India and China to transition to sustainable energy systems through issuing comprehensive reports on alternative energy policies that are cost-effective and sustainable.

²¹ This term refers to a specific agricultural production model aimed at improving soil health, minimizing water use, and reducing sources of pollution that harm agricultural production. This creates an agricultural production chain that can be sustained without risking the needs and abilities of future generations that will also rely on scarce resources, particularly land and water. For further information, see <https://sarep.ucdavis.edu/sustainable-ag>

²² To access the detailed report by the Ministry of Agriculture and Forest, <https://www.tarimorman.gov.tr/CEM/Belgeler/yay%C4%B1nlar/yay%C4%B1nlar%202017/FAAL%20ING%201000%20AD.pdf>



Drought shrinks Salt Lake basin. (Hacı Özkan - Anadolu Agency)

Concluding remarks

Assessing the short-term impacts of global climate change is a critical step towards deepening our understanding of the issue and developing viable policies to mitigate its long-term effects. Both environmental effects and their impacts on our daily lives are linked to each other and tend to create further problems. Increasing frequency in extreme weather events, change in precipitation regimes, soil degradation, melting glaciers, as well as the increasing frequency of wildfires are some of the short-term impacts of global climate change that have been observed. Due to the high level of issue-linkage, impacts on one particular area directly affect other areas and intensify the problem, albeit unevenly. Also, the unequal distribution of short-term impacts makes some regions, particularly sub-Saharan Africa and low latitude areas, more vulnerable in the face of climate change. The short-term impact of global climate change on agricultural productivity is one major factor that is linked to food security. For the policy side of the issue, we can list certain recommendations as prospective solution mechanisms. Broadening the participation of epistemic communities in the decision-making processes, raising public awareness, as well as adapting sustainable development strategies are essential parts of any short-term solution mechanisms. The fact that causation still remains inadequate in the assessment of the relationship between the short term impacts that we observe and human-induced climate change constitutes a major gap that needs to be bridged through increasingly sophisticated scientific studies by epistemic communities. A vertical expan-

sion model for epistemic communities is also fundamental, involving local and regional proliferation of scientific groups. Considering the uneven ideational gap between generations on particular issues, projects of public awareness should be presented in plain language that can be understood by segments of society coming from different intellectual and educational backgrounds. Educative projects from primary schools to the higher education level should be considered and the required level of knowledge and awareness should be taught to the students for whom the long-term impacts will be more devastating.

In general, the short-termism of authorities regarding greenhouse gas emission targets and other commitments can be mitigated by a careful assessment of the short-term impacts of climate change. With the increasing problem of food security as a result of agricultural productivity aggravated by unequal distribution of climate change impacts, the issue began to transform into a question of humanity and gains a moral dimension as well. Redefinition of interests in accordance with both short-term and long-term impacts of climate change is also very important. What we try to maximize in the short term could completely destroy the long-term prospects for success for economic and political interests. Hope depends on our current performance in the light of scientific knowledge focusing on both global and local dimensions and whether we care about the observable short-term impacts and take the required steps.

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