

**THE LASTING IMPACT OF CLIMATE CHANGE**  
**Lecture to Guangdong University**  
**School of Foreign studies**  
**July 7, 2021**

**•Good afternoon Class!**

**My name is Mehri Madarshahi. Happy to meet you all on line and I hope our next encounter would be in person when we can shake hand and interact in person.**

**Today we , as you very well know, speak about “climate change”. Some preliminary reading materials related to the 17 Sustainable Development Goals, and information on climate change as well as an introductory video about the topic have already been provided to you which I hope you found them useful. (Slide 1) In the course of the next hour, I try to touch upon the most important aspects of climate change and its long lasting impact on our present and future. You are welcome to ask or answer questions during my presentation and I certainly hope soon after I see you all as advocates for a better future and a more sustainable climate.**

**Let us start with the basic definition of this term. (Slide 2)**

**“Climate changes is a change in global or regional climate patterns. It is attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.**

**Now the main question here relates to (slide 3)why climate change is so important and what is its impact and implications on our daily and active life?**

**Based on what you know, can you articulate in a few words an answer to this question?**

**My presentation today comprise of three topics. (Slid 4)**

**These three topics encompass the United Nations Sustainable Development Goals (SDGs), the impact of COVID 19, and then their linkages to the existential threat of climate change. We certainly cannot consider these issues in isolation. We must tackle them together.**

**I am sure by now you are familiar with the United Nations 2030 Agenda for Sustainable Development which was adopted by all 196 United Nations Member States in 2015 ( Slide 5). The Agenda provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.**

**(Slide 6) Sustainable Goals and their 167 targets embrace all aspects of human life.. Among these goals in particular I wish to draw your attention to Goals No 1 (No poverty), No 3 (Good Health and wellbeing), No11 (Sustainable cities) and 13-15 on climate related issues such as water, land and ocean. As it shown in slide 7 all components of the SDGs function together in a cohesive manner. The implementation decade stretches between 2020 to 2030.**

**Needless to say that the unfortunate and unpredictable pandemic put a halt on the beginning of the implementation decade and as predicted it reversed years of progress in human health, prosperity and sustainable development..(slide 8)**

The pandemic became famous as COVID 19 which caused the biggest crisis the world has sustained since the second world war and the biggest economic disaster since the Depression of the 1930s..

The virus did not only have devastating effects on individual health and circumstances, but its deep and unforeseen impacts were also felt along the entire socio-economic and political spectrum in every corner of the world. (slide 10)

Authorities worldwide rushed to contain the spread of the COVID 19, as some countries outside China experienced a massive spike in infections. The virus reached more than 210 countries and territories, with over 21 million infected and it led to nearly 3 million deaths worldwide.

Soon thereafter, a cascade of regulations in many countries were imposed, ranging from total lockdowns of cities and regions to stay-home orders.. Spain, Italy, and France took the lead. Partial closures were introduced also in Germany, New York City, San Francisco and other US cities as well as the United Kingdom. Borders between countries were ordered closed and the free movement of people across Europe, the United States and neighboring Canada and Mexico was interrupted. Around the world, schools, universities and all other educational centers were shut down. Many schools resorted to distance and online learning. These measures marked a turning point in the life for many people, which may well be disrupted for the foreseeable future. Worldwide, given this unusual “new normal“ situation, many important international games and sport events were postponed, including the Tokyo Olympic Games 2020.

International politics were also affected. COP15 (Conference of Parties) of the Biodiversity Convention planned for end-October 2020 in Kunming, China was postponed. Other major international events like COP26 of the Climate Change Convention were rescheduled for November 2021 in Glasgow, UK.

**Within the European Union, Prime Minister Andrej Babis of the Czech Republic proposed that the European Green Deal, a new policy package that commits European Union member states to zero emissions should be set aside so that countries can focus on fighting the pandemic..**

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**Since your major is in economics, I think it may be useful to refer to some economic impacts and financial consequences of COVID 19. (slide 11)**

**As of the beginning of 2020, equity markets were heavily impacted and uncertainty affecting the financial, savings and loan drove the markets and the banking systems to exceedingly low levels.(slide 12)**

**Asia became under pressure, with Japan benchmark falling and the Australian S & P shed a few percent. In South America, Argentina's biggest bondholders rejected t government's offer to restructure its US\$83 billion of foreign debt, raising the prospect that the country is heading for its ninth sovereign debt default**

**In its annual report, the IMF presented a grim forecast about the magnitude of the shock that the pandemic has inflicted on both advanced and developing economies and the daunting tasks that policymakers face in containing its fallout for years to come.**

**It is estimated that the cumulative loss to global GDP over 2020 and 2021 -from the pandemic crisis- could be around 9 trillion US dollars, greater than the economies of Japan and Germany combined.**

**With capital markets remained locked up for a longer time, it however, become difficult for companies to secure financing for planned solar, wind and electric grid projects – halting the trend towards new and renewable sources of energy.**

**A global recession as a result of this virus and cheaper carbon-based energy also stalled the shift to clean energy. The clean energy analyst Bloomberg NEF has already downgraded its expectations for the solar, battery and electric vehicle markets, signaling a slowdown in the such energy transition – while we urgently would need to speed it up. It is, therefore, important to highlight that the pandemic will not halt climate change and one should not expect that the clear skies with lower emission levels last.**

**Coronavirus is bad for the climate even on most macro levels. Lockdowns and social distancing have slowed climate research around the world or have grounded it to a halt. NASA is on mandatory telework. [Research flights to the Arctic](#) have been stopped, and fieldwork everywhere is being canceled. No one knows how much climate data will be collected as a result, or when research might be start again**

**Slide 14 - •Climate change is Not only a serious threat to the planet and to people, but it also threatens the global economy. This problem needs public-private sector collaboration to change the way we produce goods with other methods that guarantee and drive the development of sustainable economic growth and not harm the environment.**

Slide 15

As is, the CO<sub>2</sub> molecules can persist in the atmosphere for over 200 years

and the present drop in emissions will be temporary unless something drastic is done.

**By 2020, the global warming reached 1.2°C above pre-industrial levels. This was the cause of severe tropical cyclones and storms leading to more frequent and intense cold and heat waves. Such extreme events will profoundly affect life on land and in the sea, primarily in the form of habitat loss, migratory shifts, and “trophic cascades”**  
**These extreme events have damaged infrastructure, put lives at risk, caused significant economic losses, and hamper progress made on multiple SDGs.**

**The atmospheric concentration of carbon dioxide is a key indicator of the state of the global climate The ultimate concentration level is the result of exchanges between the atmosphere, the biosphere, and the ocean - and reflects a balance between sources like human-caused emissions, and the sinks that absorb them.**

**(slide 16) One of Earth's biggest carbon sinks is the ocean, which captures between 25% and 30 % of all CO<sub>2</sub> emissions. The CO<sub>2</sub> that is not absorbed by natural carbon sinks remains in the atmosphere; as its concentration rises alongside other greenhouse gases, it perpetuates the “greenhouse effect” and accelerates warming processes.**

**(slide 17) 1% of this energy accumulation warms the atmosphere, 3% dissipates into the ground, 3% melts sea ice, ice sheets, and glaciers, and 93% is trapped by the ocean. As CO<sub>2</sub> dissolves into the ocean it turns into acid ions and reduces pH, which threatens marine ecosystems (a key indicator of progress on SDG 14, “Life Below Water”)**

In fact, CO2 concentration is at least indirectly related to risks outlined in nearly all 17 of the SDGs, and reducing emissions is therefore necessary to achieve the goals.

(slide 18) Global warming can also cause **Sea level** rise that lead to displacement of populations, impoverishment, and political fracture. Coastal flooding can cause the salinization of ground water, and result in soil becoming inundated with salt water - contaminating it and harming crops in ways that threaten yields and damage farmers' livelihoods and food security (SDG 1 targets poverty, while SDG 2 targets hunger, and both may be undermined). The increased risk of water contamination during flooding as a result of sea level rise can undermine progress made on SDG 3, "Good Health and Well-Being," and on SDG 6, "Clean Water and Sanitation." This threatened state of access to clean water along with diminished food security and livelihoods create an increased risk of local conflict - potentially further raising the risk of population displacement. (Slides 19=20) As always, it should be noted that many of the risks posed by sea level rise will be felt disproportionately around by people already faced with socioeconomic and gender inequalities.

Now let us turn our attention to another important matter which we mostly do not think it has much room in our daily discussions, I am referring to "Sea Ice". (Slide 21=24)

Yes. Sea Ice. Did you know that in 2020, the arctic ice was melting rapidly and annual minimum sea-ice extent in the Arctic was the second lowest on record?,

Do you know that changing sea ice can impact the global climate system?

Weakening the jet stream and causing warm air to creep north and cold air to plunge south. Another significant impact of sea ice on the global

climate is faster local warming. As light surfaces like sea ice become more reflective, more solar radiation bounces back into the atmosphere.

Given the connections across marine ecosystems, changes in Arctic and Antarctic sea ice could have global repercussions, threatening biodiversity in ways that can affect livelihoods, increase poverty, decrease food security for those depending on fishing yields, and undermine several SDGs. And, as ice melts and creates fewer blockages, new routes for transportation are becoming available - increasing commercial traffic and possibly further exacerbating pollution in ways that hurt marine life and potentially fuel conflict.

Another contributing factor to climate change are the soundness of the Glaciers, They provide freshwater to millions of people around the world, and their fate is tied to the changing climate.

Glaciers are distributed across the planet, with concentrations in the high mountain ranges of Asia, and in both North America and South America. Glacial mass balance is defined as the sum of all gains and losses in ice mass.

[Preliminary data show that 2020 was the 33rd consecutive year in which rapid melting glaciers were recorded.](#)

Glaciers have a significant impact on the global climate. In the past decade alone, glacial mass loss (particularly ice sheets in Greenland and the Antarctic) has accounted for nearly a third of the total sea-level rise. As cold glacial water melts into the ocean, changing ocean circulation could significantly alter weather patterns around the world, putting habitats and ecosystems at risk . This trend hinders upon SDG 15, “Life on Land.”



**As glaciers recede and the snow-free seasons lengthen, biodiversity will also be at risk. This happens as plants and animals are forced to move and establish habitats in new areas.**

**Glaciers are now melting so quickly that they pose an increased risk of floods and contaminated water, hindering SDG 6 (“Clean Water and Sanitation”). Landslides, mudslides and avalanches can also occur, putting lives at risk and threatening infrastructure including homes and businesses, disrupting transportation, exacting significant economic losses causing development setbacks, and undermining a number of SDGs. These disruptions also risk agricultural yields, threatening the livelihoods of people who depend on them and undermining food security in ways that also hinder efforts related to the SDGs.**

**This brings us to the ocean. The ocean covers more than 70% of Earth’s surface and has an incredible capacity to store heat - lending it a central role in stabilizing the global climate system. In 2019, ocean heat content reached record levels. As water warms, its volume increases - and thermal expansion is responsible for between 30% and 55% of sea level rise during the 21st century.**

**Warming, particularly during marine heat waves and deoxygenating, can also contribute to an increased risk of harmful algae blooms that cause significant impacts to both marine biodiversity and human health. Higher temperatures can negatively impact keystone species like coral reefs, for example - and as these reefs are damaged, so too are natural heritage sites, tourism opportunities, and the many livelihoods that depend on them. These undermine multiple different SDGs.**

**(Slide 25)**

**Ultimately, changes in marine biodiversity can lead to reduced fishing yields, and further threaten livelihoods while expanding poverty, threatening food security, and potentially leading to conflict over increasingly scarce resources. It is important to note that these impacts will have significantly worse implications for temperature rise and**

extreme events also distort rainfall, snowmelt, river flows, and groundwater, with implications for SDG 6 - “Clean Water and Sanitation.”

Extreme events also threaten infrastructure in ways that put health at risk, damage property and communities, disrupt transportation, cause economic loss and hinder development - potentially undermining multiple SDGs. SDG 3, “Good Health and Well-Being,” is placed at risk, for example, due to social and environmental disruption that can enable disease to spread more easily, and cause significant trauma that impacts mental health. The combination of extreme events, health issues, water scarcity, and food insecurity increases the risk of people already affected by socio-economic and gender systemic inequalities.

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The World Meteorological Organization has established seven climate indicators to provide a holistic picture of the global climate system, and the risks posed by altering it. The ultimate aim of the indicators is to improve our collective understanding of the complex ways climate

change threatens sustainable development - and encourage more drastic and immediate climate action.

Urban planners are also advised to take a lesson and concentrate on making cities less dense - by avoiding overcrowding, minimizing car use and building inclusive communities with affordable housing.

### How the international community help in mitigating climate change?

Starting from early 1970s, the United Nations dealt with sustainability of environment and global warming issues. In 1992, at the Earth Summit in Rio de Janeiro, Brazil, the United Nations sought to help Governments rethink economic development and find ways to stop polluting the planet and depleting it's natural resources.

The two-week "Earth Summit" led to the adoption of [Agenda 21](#), an official global consensus on development and environmental cooperation.

This initiative was followed by a meeting in Paris , where the Paris Agreement or COP 21 was adopted by all 196 Parties to the [United Nations Framework Convention on Climate Change](#) on 12 December 2015.

In the context of this agreement, all countries decided to work to limit global temperature rise to well below 2 degrees Celsius.

Implementation of the Paris Agreement is essential for the achievement of the [Sustainable Development Goals](#), and it provides a roadmap for climate actions that will reduce emissions and build climate resilience.

The agreement also aimed at strengthen the ability of countries to deal with the impacts of climate change, through appropriate financial flows, a new technology framework and an enhanced capacity building framework.

Soon after the adoption of the climate actions the United Nations

Secretary-General Ban Ki-moon convened a special “High-Level Event on Entry into Force of the Paris Agreement on Climate Change” at the UN Headquarters in New York, to provide an opportunity for other countries to publicly commit to joining the Paris Agreement before the end of 2016.

#### **COP22: Marrakesh, 2016**

The 22nd session of the Conference of the Parties (COP 22) took place in Marrakesh, Morocco. During COP 22, parties began preparations for the entry into force of the Paris Agreement, and to encourage actions to implement the agreement that will address climate change

#### **COP2017**

The 2017 UN Climate Conference took place in Bonn, Germany, from 6-18 November. Leaders of national governments, cities, states, business, investors, NGOs and civil society gathered to speed up climate action to meet the goals of the Paris Climate Change Agreement.

#### **COP 2018**

At the end of COP24, countries stressed “the urgency of enhanced ambition in order to ensure the highest possible mitigation and adaptation efforts by all Parties,” and agreed on a set of guidelines for implementing the landmark 2015 Paris Climate Change Agreement.

#### **COP25: Madrid, 2019**

COP25 – brought the world together to consider ways to strengthen the implementation of the Paris Agreement. Took place from 2 to 16 December in Madrid, the Conference came at a time when new data

shows the climate emergency is getting worse every day, and is impacting people's lives everywhere, whether from extreme heat, air pollution, wildfires, intensified flooding or droughts

COVID 19 was the reason for rescheduling of the next round of meetings from November 2020 to 31 October 2021. The main areas of concentration for COP 26 is to uphold the main aim of the Paris Agreement to keep a global average temperature rise this century well below 2 degrees Celsius, The ultimate objective of all agreements is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, in a time frame which allows ecosystems to adapt naturally and enables sustainable development.

Who does what for mitigation of climate change?

Slides 27 and 28 (Read)

G-7 Industrial Countries

(Slide 28)

During month of June 2021, the G-7 Industrial Countries met in the UK to draw the road map for Glasgow meeting in October this year.

Probably it worth noticing that the G-7 nations emit more carbon dioxide today than when the group was created in 1975,

The Group, however, fell Short on Climate mitigations, and they did not set a date to stop burning coal, to stop burning the dirtiest fossil fuel or agree on a target for electric-vehicle adoption. They also stopped short of setting concrete measures to limit global warming.

- The final text while recognizing that coal power is “the single biggest cause” of greenhouse gases, but it only promised to “rapidly scale-up technologies and policies” in order to stop burning the fuel without capturing carbon dioxide in the next decade, in line with the countries' individual targets. The final communique lacks firm commitments on stopping coal use, raising money to help developing countries, and shifting away

from polluting cars

Nevertheless, it did make a new commitment to ending overseas investment in coal.

The G-7 meeting was to set the tone before 197 countries gather in Scotland in November for crucial climate talks hosted by Britain. U.S. and U.K. leaders have called the gathering the last chance to set a plan to limit global warming to 1.5 degrees Celsius. The British government is hoping the summit will deliver an agreement by all countries to abandon coal power, with the G-7 leading the way.

### **Challenges ahead**

Covid 19 was not only a wakeup call but it seems a dress rehearsal for the world of challenges to come.

If our species do not survive the ecological crisis, it will probably be due to our failure to imagine and work out new ways to live with the earth.

(Slide 31) Climate change is already happening: temperature is rising, drought and wild fires are starting to occur more frequently, rainfall patterns are shifting, glaciers and snow are melting and the global mean sea level is rising.

If global temperatures rise by 3.2°C it could wipe off up to 18% of GDP of the worldwide economy by 2050. Or, if forecast based on temperature increases staying on the current trajectory and the Paris Agreement and net-zero emissions targets is not being met.

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Climate change is a systemic risk that must be addressed now, warn all scientific research being done on this topic.

**It is difficult right now to imagine a world after the Covid-19 crisis. As social distancing is lifted and the economy resumes, we will still be forced to face the great existential challenge of our time: the climate emergency. How can we rebuild our economies and societies in a way that recognizes the urgency of climate action? How can we face the climate emergency head-on, seeking transformative solutions for the sectors and industries that drive the bulk of our carbon emissions?**

**Net zero is an ambitious target that cannot be achieved under our current economic model. To build a truly sustainable world, we need to fundamentally redesign the economy to replace our linear approach of “take, make, waste,” and create a circular economy promoting sustainability by design.**

**As societies adjust to these new realities and cascading governmental regulations, life in many places will no longer be the same for the foreseeable future. Everything is bound to be disrupted and transformed in an unexpected and unpredictable manner – politics, economy, production and consumption, work, transport, everyday social interactions, schooling and learning, health, relaxation, holidays.**

**So, climate change is our new challenges for survival. We all have a role to play and learn that our current actions are not enough to meet the target of 1.5C of warming. We need to do more.**

**Climate change is real, and we’re starting to see some of the ways that it affects us. It increases the likelihood of flooding in Bangkok, Florida, Malta, coastal cities of China and elsewhere and It threatens the lives and livelihood of millions of people living along the bank of these waterways.**

**So we don’t need to ask whether climate change is happening – or whether humans are causing it. Instead, we need to ask: “what can we do?”**

**What can you do that will have the biggest impact? Here are some suggestions.**

**The number one goal? Limiting the use of fossil fuels such as oil, carbon and natural gas and replacing them with renewable and cleaner sources of energy, all while increasing energy efficiency. “We need to cut CO2 emissions almost in half (45%) by the end of the next decade,” The road towards that transition includes daily decisions within your reach – like driving and flying less, switching to a ‘green’ energy provider and changing what you eat and buy.**

**Of course, it’s true that climate change won’t be solved by your buying or driving habits alone – although many experts agree these are important, and can influence others to make changes too.**

**Cars are more polluting compared to other means of transportation like walking, biking or using public transport.**

**Try to reduce your meat intakes. The meat industry contributes to global warming in three major ways. By reducing your consumption of animal protein by half, you can cut your diet's carbon footprint by more than 40%.**

**Bigger changes fall in the hand of the governments and private sectors such as cutting subsidies to–the energy and food industries, which continue to reward fossil fuels, or setting new rules and incentives for sectors like farming, deforestation and waste management.**

**Determined action to combat climate change and minimize the disruptions is integral to the successful implementation of the 17 sustainable development Goals.**

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**As the United Nations Secretary-General recently noted, the threat from the coronavirus is temporary whereas the threat from heat waves, floods and extreme storms resulting in the loss of human life will remain with us for years..**



