

# *Climate change science and policy at COP26 and beyond: Focus on Central Asia*

*Text of a blog*

*“The climate we experience in the future depends on our decisions now.” IPCC AR6*

## Introduction

This blog provides a broad overview of climate change science and policy at COP26 and beyond. It aims to inform policy makers, government officials, private sector and public at large in the countries from Central Asia of the state of climate change from scientific and policy perspective with focus on IPCC Sixth Assessment Report (AR6) and lessons from COP26 that took place in November, 2021 in Glasgow, the United Kingdom (UK).

The blog explains how through the IPCC reports climate change science is driving policy and legislation at the international level and is enabling consensus building among the Governments at key climate summits known as Conference of the Parties (COPs) to the United Nations Framework Convention on Climate Change (UNFCCC). The blog further explains how three countries from Central Asia, namely Kyrgyzstan, Tajikistan and Uzbekistan are responding to the challenges of climate change and join the international effort to fight climate emergency in this critical decade.

## How science is driving international climate policy and legislation

### Climate change through the lenses of the IPCC scientists

In response to the alarming signals from the scientists that climate is changing and that the most likely reason for this change is the human activity, or anthropogenic activity, the UN General Assembly endorsed the establishment of the IPCC in 1988.<sup>1</sup> The IPCC was established under the auspices of the World Meteorological Organisation (WMO) and the United Nations Environmental Programme (UNEP) to assess the magnitude and timing of climate changes, estimate their potential socio-economic impacts and identify potential strategies to respond.

Since its inception, the IPCC has provided scientific evidence of the anthropogenic character of climate change and its other aspects by gradually reducing associated scientific uncertainty resulting from the complexity of the Earth system. Science was, therefore, a key driving force for negotiations that led to the agreement on the UNFCCC and related climate treaties, the Kyoto Protocol and the Paris Agreement.

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<sup>1</sup> The UNFCCC defines in its Article 2 that “climate change” means a change of climate that is attributed directly and indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability over comparable period of time.

## How science reflected in the IPCC reports led to critical decisions taken at the climate change summits

The IPCC's First Assessment Report, released in 1990<sup>2</sup>, ascertained that human activities were contributing greatly to the increase of GHG concentrations in the Earth's atmosphere and may lead to irreversible change in the climate by the end of 20<sup>th</sup> century. It was this report and the supplementary report released in 1992<sup>3</sup> that informed negotiations resulting in an agreement on the UNFCCC, which recognizes that the most effective and ambitious climate action is based on the best available science. At the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992, the UNFCCC was already signed by 156 countries.

Subsequently, many releases of the IPCC reports have been associated with the key milestones in the negotiations at the climate summits and with strengthening of the legal framework under the UNFCCC. Thus, findings from the second IPCC report (SAR) informed negotiations on the Berlin Mandate at COP1 that resulted in adoption of the Kyoto Protocol at COP3.<sup>4 5</sup>

Then, the alarming conclusions of the 2007 Fourth Assessment Report (AR4) that was released right before COP13 had major impact on the negotiations and clearly conveyed that urgency was needed to address climate change. At COP13, countries adopted the Bali Action Plan (BAP), a comprehensive process that aimed to "enable the full, effective and sustained implementation of the Convention through long-term cooperative action." This was followed by the Durban Mandate agreed at COP17 to establish a legally binding deal applicable to all countries by 2015, which was to take effect in 2020.

The Fifth Assessment Report (AR5) acknowledged that It is extremely likely that human influence has been the dominant cause of the observed atmospheric warming since the mid-20<sup>th</sup> century. The report released in 2014 a year before the final leg of intense negotiations for the Paris Agreement provided a strong scientific basis for an ambitious and equitable treaty. The COP decision in relation to the Paris Agreement invited the IPCC to provide a special report on the impacts of global warming of 1.5 °C above pre-industrial levels and global greenhouse gas (GHG) emission pathways. This report that was released in 2018, was critical in reinforcing the Agreement's temperature goals, and provided pathways to the "deep emissions reductions" to be achieved through "rapid, far-reaching and unprecedented changes in all aspects of society".

Finally, the Sixth assessment report (2021 and 2022) unequivocally established that human influence has warmed the atmosphere, ocean and land. It remains to be seen to what extent findings of the report will assist Parties and other stakeholders to foster implementation of the Paris Agreement.

## How the IPCC findings informed the Glasgow Climate Pact at COP26

At COP26 the most recent scientific findings from the IPCC were put in front and centre of the Glasgow Climate Pact as clear recognition of the importance of the best available science for effective climate action and policymaking.

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<sup>2</sup> IPCC (Intergovernmental Panel on Climate Change).1990. Climate change – The IPCC scientific assessment. Edited by J.T. Houghton et al. Cambridge,UK: Cambridge University Press

<sup>3</sup> IPCC. 1992. Climate change 1992. Edited by J.T. Houghton et al. Cambridge, UK: Cambridge University Press.

<sup>4</sup> IPCC. 1995. The science of climate change. Contribution of Working Group I to the second assessment report of the Intergovernmental Panel on Climate Change. Edited by J. T. Houghton et al. Cambridge, UK: Cambridge University Press

<sup>5</sup> Bolin, B. 2009. A history of the science and politics of climate change. The role of the Inter governmental Panel on Climate Change. Cambridge, UK: Cambridge University Press. 292 pp., 24.99 EUR, ISBN 978-0-521-08873-2

Capitalising on the findings from the 2018 IPCC special report on global warming of 1.5°C, the COP recognised that the impacts of climate change will be “much lower” at 1.5°C increase compared with 2°C increase. The COP reflected the resolve by nations to pursue efforts to stay under the lower temperature limit. This put even stronger emphasis on 1.5°C goal of limiting global temperature rise, compared to the text of the Paris Agreement.

The COP also reiterated the finding from the 2018 IPCC special report that limiting warming to 1.5°C requires “rapid, deep and sustained” emissions cuts, with carbon dioxide (CO<sub>2</sub>) emissions falling to 45% below 2010 levels by 2030 and to net-zero around mid-century.

The COP welcomed the latest IPCC AR6 report of Working Group I: “The Physical Science Base” that was released in August 2021<sup>6</sup> and “expressed alarm and utmost concern” at warming having already reached 1.1°C, with remaining carbon budgets being “small and being rapidly depleted”.

This IPCC report is the first instalment of the IPCC’s AR6. As in the previous IPCC reports, the IPCC AR6 comprises also of three other reports that were released or planned to be released this year. This includes the report of Working Group II “Impacts, Adaptation and Vulnerability”<sup>7</sup> that was released in February, report of Working Group III “Mitigation of Climate Change”<sup>8</sup> that was released in April and the “Synthesis Report” that is planned to be released in September. Highlights of the Working Groups I, II and III reports are provided here.

## IPCC AR6 report “The physical Science Basis” as a “code red for humanity”

IPCC shocked the world with a landmark report by the IPCC Working Group I “The Physical Science Basis”. The report findings were described by the UN Secretary-General António Guterres as “code red for humanity”. The report suggests that we, the humans, have harmed the planet and changes in the Earth’s climate are observed in every region and across the whole climate system. Many of the changes observed in the climate are unprecedented in thousands, if not hundreds of thousands of years, and some of the changes that are already set in motion—such as continued sea level rise—are irreversible over hundreds to thousands of years.

The report provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that unless there are immediate, rapid and large-scale reductions in GHG emissions, limiting warming to close to 1.5°C or even 2°C will be soon beyond reach. It shows that GHG emissions from human activities are already responsible for around 1.1°C of warming since 1850-1900, and finds that over the next 20 years, global temperature is expected to reach or exceed 1.5°C of warming unless further measures are taken.

Yet, the report makes some points of cautious optimism stating that strong and sustained reductions in emissions of carbon dioxide (CO<sub>2</sub>) and other GHGs would limit climate change. It’s

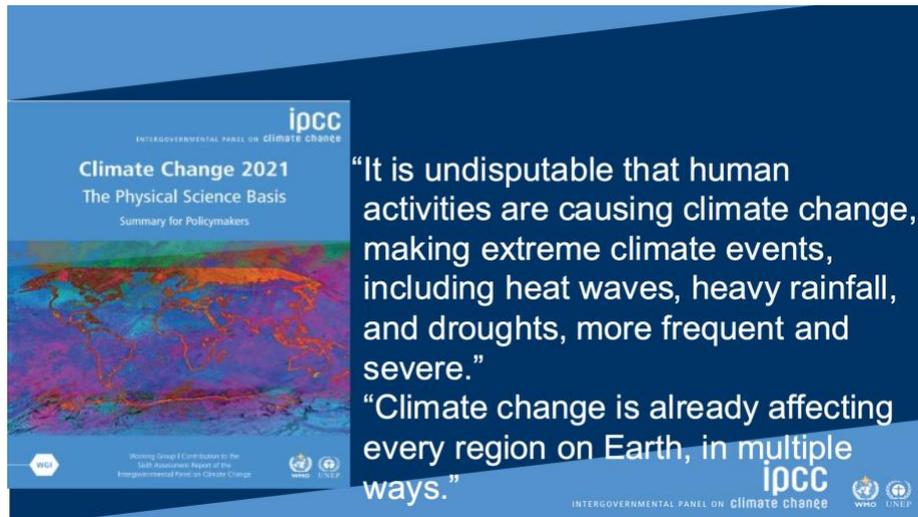
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<sup>6</sup> Intergovernmental Panel on Climate Change. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. V Masson-Delmotte, P Zhai, A Pirani, et al. (eds.). Cambridge: Cambridge University Press. Available at <https://www.ipcc.ch/report/ar6/wg1/>.

<sup>7</sup> Intergovernmental Panel on Climate Change. 2022. Climate Change 2022: Impacts, Vulnerability and Adaptation. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Hans-O. Pörtner (Germany), Debra C. Roberts, et al. (eds.). Cambridge: Cambridge University Press. Available at <https://www.ipcc.ch/report/ar6/wg2/>.

<sup>8</sup> Intergovernmental Panel on Climate Change. 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Jim Skea (United Kingdom), Priyadarshi R Shukla (India) et al. (eds.). Cambridge: Cambridge University Press. Available at <https://www.ipcc.ch/report/ar6/wg3/>

not too late to change course and avoid total catastrophe, but governments must do their part. And they must do it fast.



Key findings and some highlights from the report based on the IPCC information are provided here. The Summary for Policymakers of the Working Group I contribution to the AR6 as well as additional materials and information are available at <https://www.ipcc.ch/report/ar6/wg1/>.

## Key Findings: IPCC AR6: Working Group I The Physical Science Basis

Recent changes in the climate are widespread, rapid, intensifying, and unprecedented in thousands of years. Such changes are expected to continue, as under all emissions scenarios outlined in the IPCC report, the earth's surface warming is projected to reach 1.5C or 1.6C in the next two decades.

"It is unequivocal that human influence has warmed the atmosphere, ocean and land.". This makes extreme climate events, including heat waves, heavy rainfall, and droughts, more frequent and severe.

There have been enormous developments in attribution science the previous IPCC reports as with enhanced models, scientists are now able to quantify how much more likely or intense extreme weather events were because of climate change.

Climate change is already affecting every region on Earth, in many different ways. Modelling show, for example, that the Arctic is warming faster than other regions, while warming in the tropics is slower, and the Gulf Stream is very likely to weaken over the century. The changes we experience will increase with further warming.

Some changes in the climate system that are often called "tipping points" are irreversible and there is no going back. Forests, for example, could start to die as temperatures rise, becoming less able to absorb carbon dioxide, leading to further warming. However, some changes could be slowed, and others could be stopped by limiting warming.

Unless there are immediate, rapid, sustained and large-scale reductions in GHG emissions, limiting warming to 1.5°C and even 2°C will be soon beyond reach. Such reductions in CO<sub>2</sub>, methane, and other GHGs in this decade and net zero emissions by 2050 are critical.

Such reductions together with reductions of the "short-lived climate forcers" such as aerosols and particulate matter would not only reduce the consequences of climate change but also improve air quality.

Source: IPCC, <https://www.ipcc.ch/report/ar6/wg1/>, and Carbon Brief <https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-report-on-climate-science>

### Every region is facing increased changes

The report projects that in the coming decades climate changes will increase in all regions. For 1.5°C of global warming, there will be increasing heat waves, longer warm seasons and shorter cold seasons. At 2°C of global warming, heat extremes would more often reach critical tolerance thresholds for agriculture and health. But it is not just about temperature. Climate change is bringing multiple different changes in different regions – which will all increase with further warming. These include changes to wetness and dryness, to winds, snow and ice, coastal areas and oceans, such as:

- Intensified water cycle with more intense rainfall and draughts;
- Changed rainfall patterns with more precipitation in the higher latitude and decrease over large parts of the subtropics;

- Continued sea level rise and more frequent and severe coastal flooding in low-lying areas and coastal erosion;
- Amplified permafrost thawing, and the loss of seasonal snow cover, melting of glaciers and ice sheets, and loss of summer Arctic sea ice;
- Changes to the ocean, including warming, more frequent marine heatwaves, ocean acidification, and reduced oxygen levels;
- Amplified aspects of climate change in cities, such as heat waves, flooding and sea level rise in coastal cities

For the first time since the launch of the IPCC assessment, AR6 provides a more detailed regional assessment of climate change, including a focus on useful information that can inform risk assessment, adaptation, and other decision-making, and a new framework that helps translate physical changes in the climate – heat, cold, rain, drought, snow, wind, coastal flooding and more – into what they mean for society and ecosystems. This regional information can be explored in detail in the newly developed Interactive Atlas ([IPCC WGI Interactive Atlas](https://www.ipcc.ch/report/ar6/wg1/)) as well as regional fact sheets, the technical summary, and underlying report. The Interactive atlas will be a valuable tool to deepen the understanding of climate change at the regional level by scientists and to communicate climate science by educators.

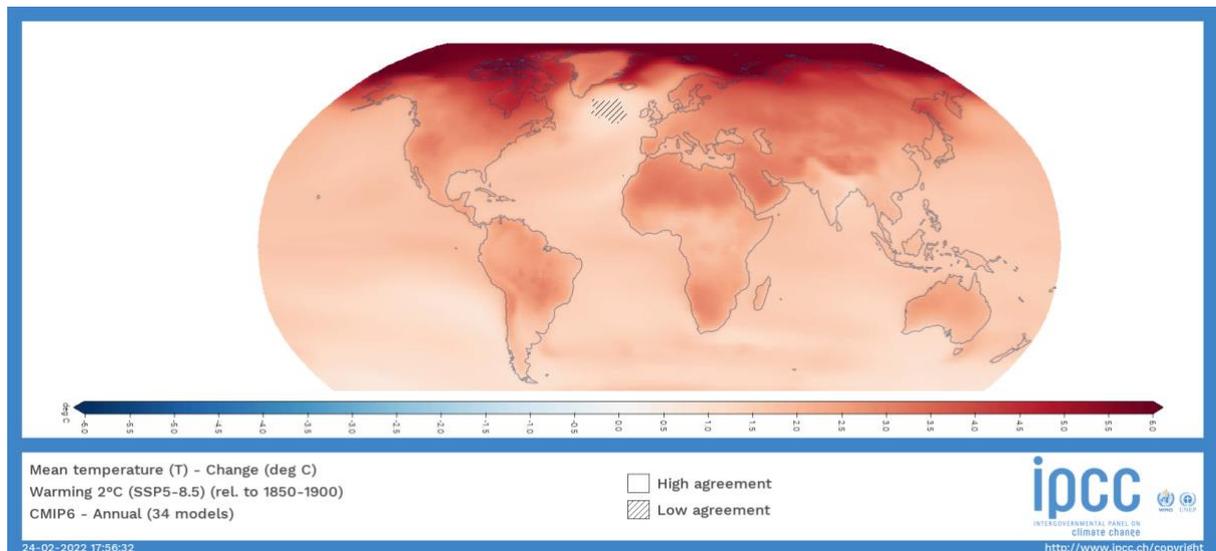


Figure 1: A glimpse into the results generated by the Interactive Climate Atlas, developed by the IPCC Working Groups I. Source: <https://www.ipcc.ch/report/ar6/wg1/>.

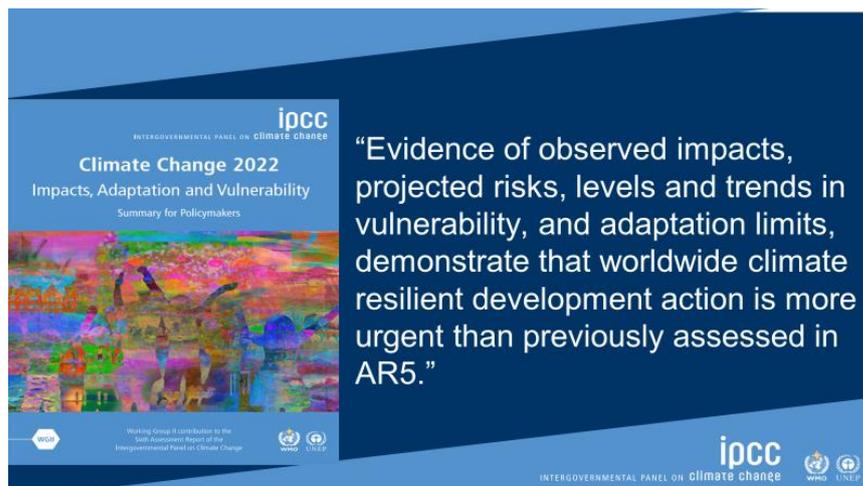
### Human influence on the past and future climate

The IPCC AR6 confirms with even greater certainty than the previous IPCC reports that the Earth's climate is changing, and the undisputable role of human activities in such changes. What is new in the report are the major advances in the science of attribution that allows to understand the role of climate change in intensifying specific weather and climate events such as extreme heat waves and heavy rainfall events.

The report also shows that we still have time and opportunity to act and change the future course of climate. It makes it abundantly clear that carbon dioxide (CO<sub>2</sub>) is the main driver of climate change. It concludes that stabilizing the climate will require strong, rapid, and sustained reductions in GHG emissions having net zero CO<sub>2</sub> emissions by mid-century. Limiting other GHGs and air pollutants, especially methane, could have benefits for both, health and the climate.

## IPCC AR6 report “Impacts, Adaptation and Vulnerability” showing that stakes for our planet have never been higher

The IPCC Working Group II report “Impacts, Adaptation and Vulnerability” examines the impacts of climate change on nature and people around the globe. It shows that human induced climate change has caused widespread impacts and where we are going in the future where such impacts will increase with increase in global warming. It explores future impacts at different levels of warming and the resulting risks. It offers frameworks and options to strengthen nature’s and society’s resilience to ongoing climate change, to fight hunger, poverty, and inequality and keep Earth a place worth living on for current as well as for future generations.



Key findings and some highlights from the report based on the IPCC information are provided here. The Summary for Policymakers of the Working Group II contribution to the AR6 as well as additional materials and information are available at <https://www.ipcc.ch/report/ar6/wg2/>.

### **Urgent action required to deal with increasing risks**

Increased heatwaves, droughts and floods are already exceeding plants’ and animals’ tolerance thresholds, driving mass mortalities in species such as trees and corals. These weather extremes are occurring simultaneously, causing cascading impacts that are increasingly difficult to manage. They have exposed millions of people to acute food and water insecurity, especially in Africa, Asia, Central and South America, on Small Islands and in the Arctic.

To avoid mounting loss of life, biodiversity and infrastructure, ambitious, accelerated action is required to adapt to climate change, at the same time as making rapid, deep cuts in GHG emissions. So far, progress on adaptation is uneven and there are increasing gaps between action taken and what is needed to deal with the increasing risks. These gaps are largest among lower-income populations.

## Key Findings: IPCC AR6: Working Group II Impacts, adaptation, and vulnerability

Climate change has already caused “substantial damages and increasingly irreversible losses, in terrestrial, freshwater and coastal and open ocean marine ecosystems”. Some development and adaptation efforts have reduced vulnerability. Across sectors and regions, the most vulnerable people and systems are observed to be disproportionately affected.

Approximately 3.3 to 3.6 billion people already “live in contexts that are highly vulnerable to climate change”. It is likely that the proportion of all terrestrial and freshwater species “at very high risk of extinction will reach 9%, at 1.5°C”, 10% at 2°C and 12% at 3°C.

Where climate change impacts intersect with areas of high vulnerability, it is “contributing to humanitarian crises” and “increasingly driving displacement in all regions, with small island states disproportionately affected”.

Approximately 50-75% of the global population could be exposed to periods of “life-threatening climatic conditions” due to extreme heat and humidity by 2100. Climate change “will increasingly put pressure on food production and access, especially in vulnerable regions, undermining food security and nutrition”.

Increasing weather and climate extreme events “have exposed millions of people to acute food insecurity and reduced water security”, with the most significant impacts seen in parts of Africa, Asia, Central and South America, small islands and the Arctic. Such events “will significantly increase ill health and premature deaths from the near- to long-term”.

There are feasible and effective adaptation options which can reduce risks to people and nature, and progress in adaptation planning and implementation has been observed across all sectors and regions, generating multiple benefits. However, adaptation progress is unevenly distributed with observed adaptation gaps.

Considering climate change impacts and risks in the design and planning of urban and rural settlements and infrastructure is critical. Yet, maladaptation should be avoided by flexible, multi-sectoral, inclusive and long-term planning and implementation of adaptation actions.

Evidence of observed impacts, projected risks, levels and trends in vulnerability, and adaptation limits, demonstrate that worldwide climate resilient development action is more urgent than previously assessed in AR5.

Climate resilient development is enabled when governments, civil society and the private sector make inclusive development choices that prioritise risk reduction, equity and justice, and when decision-making processes, finance and actions are integrated across governance levels, sectors and timeframes

Safeguarding biodiversity and ecosystems is fundamental to climate resilient development, in light of the threats that climate change poses to them and their roles in adaptation and mitigation.

Source: IPCC: <https://www.ipcc.ch/report/ar6/wg2/>, and Carbon Brief, [https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-on-how-climate-change-impacts-the-world?utm\\_campaign=Marketing&utm\\_medium=email&utm\\_source=Revue%20newsletter](https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-on-how-climate-change-impacts-the-world?utm_campaign=Marketing&utm_medium=email&utm_source=Revue%20newsletter)

## **Safeguarding and strengthening nature is key to securing a liveable future**

The optimistic message from the report is that we have now better scientific understanding of the options to adapt to a changing climate. What is rather new in the report are the new insights into nature's potential not only to reduce climate risks but also to improve people's lives.

The report proves that healthy ecosystems are more resilient to climate change and provide life-critical services such as food and clean water. Society can harness benefits from nature's capacity to absorb and store carbon by restoring degraded ecosystems and effectively and equitably conserving 30 to 50 per cent of Earth's land, freshwater and ocean habitats. To do this, adequate finance and political support are essential.

Scientists point out that climate change interacts with global trends such as unsustainable use of natural resources, growing urbanization, social inequalities, losses and damages from extreme events and a pandemic, jeopardizing future development. Dealing with these challenges requires engagement by governments and all other stakeholders. It requires sustained effort to understand and set priorities on risk reduction, as well as taking conscious effort to take fully into account equity and justice, in decision-making and investment.

## **Cities: Hotspots of impacts and risks, but also a crucial part of the solution**

This report provides a detailed assessment of climate change impacts, risks and adaptation in cities, where more than half the world's population lives. It establishes that "4.3 billion urban people" are already "increasingly adversely affected. This means that their health, lives and livelihoods, as well as property and critical infrastructure, including energy and transportation systems, are being increasingly adversely affected by hazards from heatwaves, storms, drought and flooding as well as slow-onset changes, including sea level rise.

The report highlights the complex risks stemming from growing urbanization and climate change. Such risks are particularly high and visible for cities that already experience pressures stemming from poorly planned urban growth, high levels of poverty and unemployment, and a lack of basic services.

On the other hand, there are plenty opportunities for climate action in the cities, such as green buildings, reliable supplies of clean water and renewable energy, and sustainable transport systems that connect urban and rural areas can all lead to a more inclusive, fairer society.

There is increasing evidence of adaptation that has caused unintended consequences, for example destroying nature, putting peoples' lives at risk or increasing GHG emissions. This can be avoided by involving everyone in planning, attention to equity and justice, and drawing on Indigenous and local knowledge.

## **A narrowing window for action**

Similarly, to the IPCC Working Group I report "The Physical Science" the Working Group II report "Impacts, Adaptation and Vulnerability" provides extensive regional information to enable climate resilient development. This scientific information is highly relevant for the governments when shaping their adaptation policy and responses.

The report clearly states that climate resilient development is already challenging at current warming levels. It will become more limited if global warming exceeds 1.5°C. In some regions such development will be impossible if global warming exceeds 2°C. This key finding underlines the urgency for climate action, focusing on equity and justice. Adequate funding, technology transfer, political commitment and partnership lead to more effective climate change adaptation and emissions reductions. Conversely, any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future.



*Figure 2: Woman collecting water in the parched wetlands of the Central Marshes of southern Iraq, Source: [John Wreford](#), Shutterstock.com.*

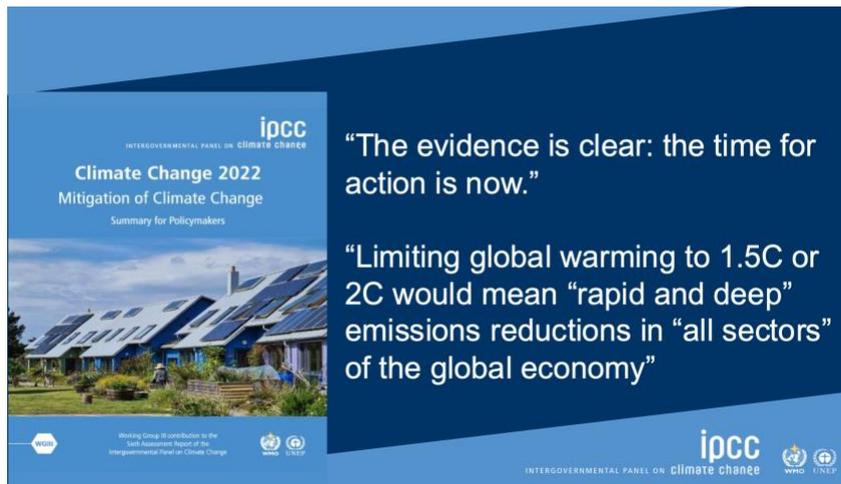
## IPCC AR6 report “Mitigation of climate change” confirming that the decisions that we can take today can ensure liveable future

The latest IPCC AR6 report of Working Group III “Mitigation of climate change” that was referred to as “our last best hope” showed that in 2010-2019 average annual global GHG emissions were at their highest levels in human history, yet the rate of growth has slowed. We must act now, as without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C is beyond reach.

However, there is increasing evidence of climate action and there are 24 countries that already sustainably reduced their emissions in the last ten years and provide valuable lessons to learn. We have also the knowledge and tools needed to limit the global warming. Since 2010, there have been sustained decreases of up to 85% in the costs of solar and wind energy, and batteries. Innovation policy packages have enabled these cost reductions and supported global adoption.

Governments applied an increasing range of policies, laws, regulations and market instruments to enhance energy efficiency, reduce rates of deforestation and accelerate the deployment of renewable energy. If these are scaled up and applied more widely and equitably, they can support deep emissions reductions and stimulate innovation. In addition, human behaviour, choices and consumption can contribute to climate change mitigation according to the in-depth assessment that was provided by the IPCC for the first time.

Key findings and some highlights from the report based on the IPCC information are provided here. The Summary for Policymakers of the Working Group III contribution to the AR6 as well as additional materials and information are available at <https://www.ipcc.ch/report/ar6/wg3/>.



### Key Findings: IPCC AR6: Working Group III Mitigation of Climate Change

Global net anthropogenic GHG emissions during the decade (2010-19) were higher than any previous time in human history. However, this must change as in pathways that limit warming to 1.5°C, global CO<sub>2</sub> emissions peak at the latest before 2025 and fall to 48% below 2019 levels in 2030 reaching net-zero by the early 2050s.

Already at least 90% of global GHG emissions are covered by climate targets that are pledged in the NDCs, but only 53% are covered by laws. The current targets to 2030 are awfully inadequate as they would make it “impossible” to limit warming to 1.5°C and will “strongly increase the challenge” for 2°C.

We need accelerated action and transformations across all major systems to avoid the worst climate impacts. We need also changes in lifestyle and behaviors as they have a significant role to play in mitigating climate change.

All scenarios limiting warming to 2°C or below include “greatly reduced” fossil fuel use and complete phase out of unabated coal by 2050. This leaves no room for building new fossil fuel infrastructure.

“The deployment of carbon dioxide removal to counterbalance hard-to-abate residual emissions is unavoidable if net-zero CO<sub>2</sub> or GHG emissions are to be achieved.”

“The global economic benefit of limiting warming to 2°C is reported to exceed the cost of mitigation in most of the assessed literature.”

Accelerated climate action is “critical” to achieving sustainable development.

Progress on the alignment of financial flows towards the goals of the Paris Agreement remains slow and such flows are distributed unevenly across regions and sectors. Climate finance for mitigation must be 3 to 6 times higher by 2030 to limit warming to below 2°C.

Source: IPCC: <https://www.ipcc.ch/report/ar6/wg3/>, and Carbon Brief, <https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-on-how-to-tackle-climate-change>.



*Figure 3: Choosing zero- and low-carbon mobility options – like walking, biking, public transit and hybrid and electric vehicles – decreases emissions while building demand for and lowering costs of these solutions. Source: Municipalidad de Santiago/Flickr*

### **We have options in all sectors to at least halve emissions by 2030**

Limiting global warming will require major transitions in the energy sector. This will involve a substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency, and use of alternative fuels (such as hydrogen). With the right policies, infrastructure and technology in place to enable changes to our lifestyles and behaviour can result in a 40-70% reduction in GHG emissions by 2050. The evidence also shows that these lifestyle changes can improve our health and wellbeing.

Cities and other urban areas also offer significant opportunities for emissions reductions. These can be achieved through lower energy consumption (such as by creating compact, walkable cities), electrification of transport in combination with low-emission energy sources, and enhanced carbon uptake and storage using nature. There are options for established, rapidly growing and new cities.

Reducing emissions in industry will involve using materials more efficiently, reusing and recycling products and minimising waste. For basic materials, including steel, building materials and chemicals, low- to zero-GHG production processes are at their pilot to near-commercial stage. This sector accounts for about a quarter of global emissions. Achieving net zero will be challenging and will require new production processes, low and zero emissions electricity, hydrogen, and, where necessary, carbon capture and storage.

Agriculture, forestry, and other land use can provide large-scale emissions reductions and also remove and store carbon dioxide at scale. However, land cannot compensate for delayed emissions reductions in other sectors. Response options can benefit biodiversity, help us adapt to climate change, and secure livelihoods, food and water, and wood supplies.

### **The next few years are critical**

In the scenarios assessed by the scientists, limiting warming to around 1.5°C requires global CO<sub>2</sub> emissions to peak before 2025 at the latest, and fall to 48% below 2019 levels by 2030; at the same time, methane would also need to be reduced by about a third. Net global GHGs fall 43% by 2030 and 84% by 2050. The global temperature will stabilise when CO<sub>2</sub> emissions reach net zero. For 1.5°C, this means achieving net zero in the early 2050s; for 2°C, it is in the early 2070s. Importantly, scenarios that limit temperature increase to 1.5°C or 2°C would require some level of CO<sub>2</sub> removal.

## **Closing investment gaps**

The report looks beyond technologies and demonstrates that while financial flows are a factor of three to six times lower than levels needed by 2030 to limit warming to below 2°C, there is sufficient global capital and liquidity to close investment gaps. However, it relies on clear signalling from governments and the international community, including a stronger alignment of public sector finance and policy.

## **Achieving the Sustainable Development Goals**

Accelerated and equitable climate action in mitigating and adapting to climate change impacts is critical to sustainable development. Some response options can absorb and store carbon and, at the same time, help communities limit the impacts associated with climate change.

For example, in cities, networks of parks and open spaces, wetlands and urban agriculture can reduce flood risk and reduce heat-island effects. Mitigation in industry can reduce environmental impacts and increase employment and business opportunities. Electrification with renewables and shifts in public transport can enhance health, employment, and equity

## **COP26 lessons**

### **COP26 as a key milestone in the battle with climate change and what it means for humanity**

COP26 has a special role and place in the long list of the climate summits known as COPs that represent major milestones in the long battle with climate change.

In preparing for COP26, the UK COP Presidency made strong use of its agenda-setting power to drive discussions on its priorities that were referred to as “coal, cars, cash and trees” and set expectations. Politically, these expectations were framed as follows: enhancing climate finance, including mobilization of \$ 100 billion support for developing countries; keeping fair chances to limit the temperature increase to maximum 1.5° C, often referred to as “keeping 1.5 degree alive”; advancing adaptation and loss and damage, and; finalising the Paris Rulebook.

While these expectations were broadly met, several developments went beyond them as for the first time in the UNFCCC history science was not questioned; agreement to phase down coal and inefficient fossil fuel subsidies was reached; coalition to address methane emissions was forged, and; adaptation specific financing goal of doubling support by 2025 was agreed globally.

The role of COP26 in advancing climate agenda was perhaps best captured by Patricia Espinosa, Executive Secretary of the UN Climate, who said at the opening of COP26, "We stand at a pivotal point in history where humanity faces several stark but clear choices. We either choose to achieve rapid and large-scale reductions of emissions to keep the goal of limiting global warming to 1.5°C, or we accept that humanity faces a bleak future on this planet. ... It is about more than environment; it is about peace, stability and the institutions we have built to promote the well-being of all."

### **Climate action, pledges and partnerships**

The most impactful actions at COP26 that provide evidence of the progress on climate change are the decisions to phase down coal and double finance for adaptation to the impacts of climate change for the most vulnerable nations. These actions also include a range of voluntary initiatives on methane, forests and sustainable transport that could all have very positive impacts when fully implemented.

At COP26 countries advanced on Climate Action Agenda and made bold collective commitments to curb methane emissions, to halt and reverse forest loss, align the finance sector with net-zero

by 2050, move away from the internal combustion engine, accelerate the phase-out of coal, and end international financing for fossil fuels. Glasgow was a platform for launching innovative sectoral partnerships and new funding to support these, with the aim of reshaping every sector of the economy at the scale necessary to deliver a net-zero future.

Among the initiatives launched at COP26, GFANZ on climate finance has the potential of becoming the initiative with potential largest impact on global emissions because it is taking on climate change from a global rather than a narrow national perspective and recognizes that sustainability requires a whole planet strategy.

### **Glasgow Climate Pact and other key outcomes from formal negotiations**

Central for the COP26 was the adoption of the Glasgow Climate Pact, as a package of wide-ranging political decisions towards a more ambitious and urgent climate response.

As noted in the part of this blog on how the IPCC findings informed the Glasgow Pact, the pact puts the IPCC's findings in front and centre and recognizes the importance of the best available science for effective climate action and policymaking.

On the current pledges that are reflected in the existing and updated Nationally Determined Contributions (NDCs) that are submitted by countries, the pact reflects serious concern that we will see emissions increase of 13.7 per cent above the 2010 level in 2030 and calls for an accelerated action in this critical decade based on science. The COP requests that countries revisit and strengthen their climate pledges by the end of 2022 to help keeping the 1.5°C goal within reach, launches a workprogramme on mitigation and calls for a phasedown of coal. Even though the call for phase down of coal lacks specific parameters, such as timing, it sends a strong signal – that of the beginning of the end of the era of coal.

A notable achievement at COP26 that is reflected in the pact is the recognition of how important adaptation is and the agreement on relevant actions. While mitigation remains crucial, pact showed that adaptation will no longer be a “secondary” topic, but one of equal importance to mitigation. The work programme to define the global goal on adaptation will identify the collective needs and solutions for the climate impacts already happening in all regions of the world. Loss and damage caused by climate change for impacts to which is impossible to adapt also gained prominence. The Santiago Network, a network that is about providing technical support for countries to address and manage loss and damage related to climate change, has now been enhanced to strengthen global efforts towards resilience. Also, the two-year Glasgow Dialogue was launched to discuss the arrangements for the funding of activities to avert, minimize and address loss and damage.

Recognising the need to support developing countries, the pact reflects agreement that developed countries should urgently deliver more resources to help climate-vulnerable countries adapt to the dangerous and costly consequences of climate change that they are feeling already – from declining crop yields to devastating storms. Such resources are also vital to help developing countries that need support in view of their national circumstances to meet the emission reduction targets enshrined in their NDCs.

Looking forward, while developed countries have yet to deliver on the pledge of \$100 billion annually by 2020 in support to developing countries there is an urgency of defining the new global goal for beyond 2025 climate finance as soon as possible. Responding to the needs of developing countries for appropriate instruments for climate finance, there was an agreement to place more attention on the grants compared to loans.

The Glasgow Climate Pact welcomed the completion of the Paris Rulebook that comprises of decisions on NDC timeline, known as “NDC common timeframes”, co-operative approaches, also

known as “Article 6 of the Paris Agreement, methodological issues on transparency, as well as NDC and adaptation registries. Agreement on transparency matters was linked to a call on the Global Environmental Facility (GEF) to increase support to developing countries on climate matters, including through the Capacity Building Initiative for Climate Transparency (CBIT) to enable smooth launch of the enhanced transparency system by the ultimate deadline of 2024.

Finally, the pact made an emphasize on the importance of international collaboration on innovative climate action, including technological advancement across all actors of society, sectors and regions, in contributing to progress to the objective of the Convention and the goals of the Paris Agreement. The Pact also places attention to the role of the non-Party stakeholders, including civil society, indigenous peoples, local communities, youth, children, local and regional governments, women and other stakeholders, as well as partnership and initiatives

### **The way forward: preparation for further engagement with UNFCCC and stronger action on mitigation, adaptation and finance**

Despite significant headway on several fronts made at COP26, national climate and financing commitments still fell far short of what is needed to come to grips with the climate challenge. This is why according to the United Nations Secretary General Antonio Guterres the 1.5°C goal of the Paris Agreement is “still in reach but on life support”.

This message is underpinned by the scientific assessment of the countries’ 2030 emission reduction pledges included in the NDCs that were submitted or updated in the lead-up and during COP26. According to the update of the UN Emissions Gap report 2021, that tracks climate pledges and their implementation, those NDCs are expected to lead to 2.5°C warming by the end of this century. When countries’ commitments to reach net-zero by around mid-century are taken into account, temperature rise could be kept to around 1.9°C. However, for some major emitters’ 2030 targets included in the NDCs are assessed as weak as they don’t offer evidence for credible pathways to achieve their net-zero targets, indicating a major “credibility gap”.

Recognising this shortfall and in view of the urgency to address climate challenge, delegates in Glasgow agreed to explore ways of increasing actions on mitigation, which will be a significant area of focus on the way forward. Delegates agreed on new and additional milestones to those already enshrined in the Paris Agreement. Hence, they agreed to submit next year stronger 2030 targets to help close the gap to 1.5°C, as well as put forward long-term climate strategies, aiming for a just transition to net-zero around mid-century. Together, these actions should help align the net-zero for 2050 and beyond with 2030 NDC targets, and boost ambition.

## What science is telling us on climate change and its impacts in Central Asia and how countries advance climate change policy objectives included in the Nationally Determined Contributions

### **IPCC on climate change and its impacts for Central Asia with a focus on Kyrgyzstan**

The detailed regional assessment of climate change for Central Asia provided in the IPCC AR6 is a valuable tool for policy makers when assessing risks and adaptation options as it allows to translate the physical changes in the climate, such as heat, cold, rain, drought, snow, wind, coastal flooding into what they mean for society, economy and ecosystems. For the countries in the Central Asia, the report provides evidence of physical changes in the climate system, such as:

- Shrinking glaciers and surface water runoff;
- Increased frequency of the extreme precipitation;

- Degradation of the permafrost in the mountain regions;
- Increased frequency and duration of droughts;
- Degradation of land, river systems and grasslands and pastures, with persistent droughts as the main factor for grassland degradation and desertification in the Central Asia in the early 21<sup>st</sup> century;
- Slowing down in terrestrial near-surface wind speed in Asia with the significant decreases in Central Asia being among the highest in the world;
- Emergence of higher fire risk due to changed climatic conditions in the West Central Asia; the potential burned areas in five Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Turkmenistan) expected to increase;
- Shifting plants and animals areals to the North and upwards in the mountains;
- Change in phenology, namely seasonal changes in the development of plants and animals, the timing of their onset and the duration of development phases depending on meteorological conditions.

Zooming in in the East Central Asia the most important observed and future climate changes could be summarised as follows:

- Daily precipitation extremes have increased over parts of the region. It is expected the heavy precipitation to increase in frequency and intensity, leading to more frequent landslides in some mountain areas;
- Droughts have become more frequent in much of continental East Asia while arid Eastern Central Asia has become wetter;
- The rate of intensity and number of strong tropical cyclones have increased, and tropical cyclone tracks likely migrated poleward.

Zooming in in the West Central Asia the most important observed and future changes could be summarised as follows:

- Anthropogenic warming has amplified droughts since the 1980s;
- An increase in extreme precipitation has been observed, mostly in elevated areas;
- Mountain permafrost degradation at high altitudes has increased the instability of mountain slopes in the past decade and reduction of the annual maximum amount of snow increases with elevation in mountain areas;
- Annual precipitation totals, intensity, and frequency of heavy precipitation are projected to increase with increasing warming levels, with overall decreasing precipitation projected in summer and the opposite tendency in winter.

Regarding temperature increase, only in the last ten years, according to the Russian Hydrometeorological Service, average annual temperatures increased in the countries from the Central Asia by 0.32°C in Uzbekistan, 0.22°C in Kyrgyzstan and 0.16°C in Tajikistan. In the future, specifically for Kyrgyzstan, scientists found that in accordance with results from a number of global climate models, the mean annual temperatures are expected to increase by 1.8°C on an average, while the average level of precipitation is not expected to change.

The shrinking of the glaciers that is already observed is of particular concern for Kyrgyzstan. Only between 1960 to 2000, the overall volume of glaciers has been reduced by around 15% to reach 417,5 км<sup>3</sup> and then to reach 390 км<sup>3</sup> in 2010. Since 2000, melting of glaciers has become not only more intense, but the period of melting has extended from early spring to late autumn. This is exacerbated by more frequent rainfalls in the high mountains compared to snowfall. According to climate modelling, by the end of the century the glaciers will shrink by 60% to 90%. This in turn will reduce the surface runoff by around 40%.

Altogether, the changes in climate system will negatively affect economy of Kyrgyzstan, in particular agriculture that will mostly suffer from draughts and energy sector that will be affected from reduced availability of hydro resources. Other systems that will be significantly affected are human health and natural ecosystems.

### **National responses and plans to deal with the climate change challenge that are reflected in the Nationally Determined Contributions towards the goals of the Paris Agreement**

The IPCC AR6 not only sends a “code red” for humanity but also provides a hope that it is still possible to limit global warming by taking action to ensure strong, rapid, and sustained reductions in CO<sub>2</sub>, methane, and other GHGs. The Paris Agreement is the international framework that provides a platform for action by all countries to limit climate change and its worst consequences.

Under the Paris Agreement, Parties are legally required to submit regularly Nationally Determined Contributions (NDCs). In essence, NDCs represent national plans to deal with climate change that should manifest how a country is undertaking ambitious efforts with regards to climate mitigation and adaptation, how countries believe that their plans are fair and ambitious, and how developing countries are supported by developed countries to take strong action by providing them with climate finance, technology and capacity building support. The policies and actions that are presented in the NDCs should contribute to reducing global GHG emissions in line with what the scientific requirements to limit the temperature increase to well below 2° C and 1.5° C.

Countries submitted their initial NDCs back in 2014 and 2015. In 2020 and 2021 they submitted new or updated NDCs by 2030. Countries from Central Asia submitted such updated NDCs as an expression of commitment by the Governments and the citizens of these countries to be a part of the international effort to deal with climate emergency. Key commitments with regards to reduction of GHG emissions by these countries and explanation on how they believe that the commitments represent a fair and ambitious contribution to the global effort are summarised in the box below.

One of the main requirements from the Paris Agreement is that each NDC submission contains commitment for GHG emission reduction that is more ambitious than that included in the previous submission. The box below also contains information provided by the countries as to why their new GHG emission pledge from the updated NDC is more ambitious than that pledged in the previous NDC submission. Comparison across the three countries suggests that they have stepped up their climate action and reflected this in the updated NDC.

#### **Box: Key emission reduction commitments by Kyrgyzstan, Tajikistan and Uzbekistan outlined in their updated NDCs and why these countries believe that such commitments are fair and ambitious**

##### **Kyrgyzstan**

**Kyrgyzstan pledged a baseline scenario target.** This means that it plans for GHG emission reduction by 16.63% in 2025 and by 15.97% in 2030 compared to projected base-line emission levels for these years. Subject to international support, Kyrgyzstan could reduce its GHG emissions even further by 36.61% in 2025 and by 43.62% in 2030 compared to such baseline emissions levels.

Kyrgyzstan explained in its NDC submission that according to the latest available GHG emission data, in 2017, its total GHG emissions accounted for only 0.032% of the total global GHG emissions, and net emissions that take into account removals from the land use and forestry accounted to just 0.011%. This small share of the global emissions reflects both, the size of economy and hydropower being by far the main source for electricity generation. However, this source is expected to be negatively affected by climate change that may reduce the hydropower availability.

The ambition and fairness of the overall mitigation goal from the NDC is considered by Kyrgyzstan to be in line with its national circumstances and to reflect the potential effects from the measures that are outlined in the updated NDC. More specifically, the average income per capita in the country, measured as Gross Domestic Product (GDP) per capita is still low as in 2017, on purchasing power basis, it amounted to USD 3,735. This corresponds to around 22% of the global level of this indicator that in 2017 stood at USD 17,100. To meet growing needs of people, the economy of the country is expected to develop and grow, and GHG emissions are expected to grow as well, but at lower pace compared to the pace estimated in the previous NDCs. Therefore, Kyrgyzstan considers that its updated NDC represents a progression compared to the previous NDC where it pledged emission reductions between 11.49% and 15.97% from the baseline emission levels projected for 2030. Subject to international support this reduction was expected to be between 29,00% and 43.62%.

### **Tajikistan**

**Tajikistan pledged an absolute emission reduction target** of GHG emission reduction up to 60% to 70% in 2030 of 1990 levels. Subject to significant international support, GHG reduction could reach 50% to 60% in 2030 of 1990 levels.

Tajikistan considers that its updated NDC is fair and ambitious as it translates to 30 to 40% reduction of GHG emissions in 2030 compared to 1990 levels as an unconditional target and 40% to 50% of 1990 levels subject to provision of international support. On a per capita basis, emissions are expected to remain among the lowest compared to the other countries in Central Asia, as they are expected to be around 1.9 to 2.2 tCO<sub>2</sub>eq for the unconditional target and around 1.5 to 1.9 tCO<sub>2</sub>eq for the conditional target. Tajikistan considers that its NDC fits into a trajectory that is consistent with the long-term goals of the Paris Agreement by 2050 and beyond.

As a lower middle-income country, Tajikistan deems it critical to continue to grow its economy with a view to achieve the UN Sustainable Development Goals and to do this it will require significant support from international community. This is consistent with Tajikistan being a developing country, also referred to as a non-Annex I Party, under the UNFCCC, to which the principle of “common but differentiated responsibilities and respective capabilities” applies.

### **Uzbekistan**

**Uzbekistan pledged emissions intensity target** of reducing GHG emission intensity of GDP by 35% in 2030 from 2010 level.

The target pledged by Uzbekistan in the updated NDC has been significantly strengthened as it is around 3 times more stringent compared to the target pledged in the previous NDC. As this is an intensity target, it means that economy of the country is expected to continue to grow in accordance with the sustainable development objectives.

Uzbekistan’s GHG emissions share in global emissions is only about 0.3%. On a per capita basis, GHG emissions decreased by 2.8 t CO<sub>2</sub>-eq and reached 5.8 t CO<sub>2</sub>-eq in 2017. High population growth rate and industrial development, including in construction, textile, automotive industry and agriculture are expected to continue to be key drivers for the growth in energy demand. This means continuous GHG emissions growth, although at lower rate than the energy demand growth rate due to the planned rapid deployment of renewable energy as part of the “green” and low-carbon development.

Uzbekistan considers that its target represents a contribution to the achievement of the goals of the Paris Agreement that is in accordance with the country's capacity and national circumstances.

Source: NDC submissions by Kyrgyzstan, Tajikistan and Uzbekistan, see <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs#eq-2>

The updated NDCs submitted by Kyrgyzstan, Tajikistan and Uzbekistan contain more detailed information that allows to understand better how the countries plan to achieve the commitments that are included in the NDCs. Countries strengthened existing policies, added policies and action to support the achievement of the new and more ambitious GHG emission targets and assessed the climate finance that is needed from both, domestic and international sources. Even though it is not entirely clear whether added or strengthened policies and actions will be sufficient to meet the targets, they enhanced credibility of the updated NDC and together with the GHG emission inventory, provide a key element for tracking progress towards NDC implementation.

In recognition of the expected impacts from climate change, the NDCs also contain significant component for adaptation with focus on sectors that are already affected by climate change, such as agriculture, water resources and mountain glaciers. They envisage specific actions for adaptation in these sectors and assess financial resources that are needed to undertake such actions.

### **Taking forward the COP26 lessons in the light of the best available science: the case of Kyrgyzstan**

Kyrgyzstan engaged in COP26 with a delegation of representatives from a number of ministries, scientific institutions and non-Governmental organisations. The delegation made the best use of its COP26 engagement to give visibility of the national efforts to fight climate change and to outline its commitment to co-operate with other nations on this matter. The delegation also got first-hand information and understanding of the state of play of the main issues from the international climate change agenda. The delegation brought this understanding home to strengthen its climate policy, identify climate action with opportunities for climate finance, and advance its NDC.

A highlight of the engagement by Kyrgyzstan was the participation by the President at the COP opening and the World Leaders Summit with a statement on climate policy of the country and commitment to international co-operation. Bilateral and multilateral meetings by the President and by the delegation of Kyrgyzstan that took place at all levels with representatives from other countries as well as international organisations dealing with climate issues and international development banks and financial facilities paved the way towards an enhanced support for climate policy by Kyrgyzstan and commitments that it included in the updated NDC.

After COP26, Kyrgyzstan participated in several regional and national meetings organised by the UNDP Kyrgyzstan. This included a national conference held on the 8<sup>th</sup> December 2021 to present to the representatives from the Government and other interested stakeholders the results from the participation of the delegation of Kyrgyzstan in COP26, what these results mean for Kyrgyzstan and discuss the way forward. This also included regional climate policy dialogue held on 2<sup>nd</sup> and 3<sup>rd</sup> February 2022 with participation of representatives from three countries, Kyrgyzstan, Tajikistan and Uzbekistan. During the dialogues, countries discussed lessons from their participation in COP26, preparation and planning for NDC implementation, preparations of the long-term low carbon development strategies and support that is needed to fully achieve targets and policy plans included in the NDCs. There was also a webinar organised on 15<sup>th</sup> March for these three countries on the results from COP26 on co-operative approaches under Article 6 of the Paris Agreement and how to plan preparation for participation in such approaches.

To inform scientists and policymakers on the IPCC Working Group I report “The physical Science Base” a national event was organised on 18<sup>th</sup> March with on-line participation of IPCC scientists, a representative from the UNFCCC secretariat, scientists working on climate change in Kyrgyzstan and policy makers engaged in planning for implementation of the NDC of Kyrgyzstan. The event helped to inform next steps in advancing NDC in the light of the recent best available science from the IPCC.

On the way forward, the main goal for Kyrgyzstan is to take climate mitigation and adaptation action in the context of its evolving NDC Implementation Plan. The plan builds on the targets and actions included in the NDCs and is informed by the COP26 results and IPCC AR6 findings. The plan aims to bring more clarity on the following issues: the scope, challenges and key milestones in implementing the NDC; the support that is needed to achieve mitigation goals and adaptation objectives included in the NDC and; engagement of all stakeholders, such as private sector and youth in implementation of NDC. The plan also aims to better integrating climate and development in the wider context of the Sustainable Development Goals. This is essential in order to ensure just transition to low carbon and climate resilient economy and society by dealing with vulnerability and poverty, alongside global warming. Kyrgyzstan also plans to continue to participate and engage more actively in the global efforts to deal with climate change, for example in the context of initiatives that it joined during COP26, such as the Glasgow Leaders' declaration on forests and land use Global Methane Initiative.

This blog is based on materials from the IPCC (<https://www.ipcc.ch/>), UNFCCC (<https://unfccc.int/event/cop-26>), Carbon Brief (<https://www.carbonbrief.org>) and WRI (<https://www.wri.org/>) as well as on the materials that were presented at the event organised by the UNDP Kyrgyzstan on 18<sup>th</sup> March, 2022 on the IPCC Working Group I report "The physical Science Base".

This blog prepared by Dr. Katia Simeonova (International expert), Lira Zholdubaeva and Baktygul Ysabekova (UNDP Kyrgyzstan).