



Climate Change and Its Impact on Increasing Poverty

Abdullayev Ilxom Xatamovich¹; Karakulov Nurbol Maidanovich²

¹Associate professor of the Department of Geography, Tashkent State Pedagogical University named after Nizami, Uzbekistan

²Senior Lecturer of the Department of Geography, Tashkent State Pedagogical University named after Nizami, Uzbekistan

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Abstract

This article discusses climate change and its occurrence, characteristics and factors influencing it. It also provides information on the impact of climate change on poverty.

Keywords: *Climate Change; Poverty; Greenhouse Effect; Global Community; Greenhouse Gases; Adaptation; Hurricanes; Ecological Systems; Waste; Arid Zones*

Introduction

Climate change refers to long-term changes in temperature and weather patterns. While these changes may be natural, such as solar cycling, since the 1800s, human activity has been the main driver of climate change, mainly through the burning of fossil fuels such as coal, oil and gas. The burning of fossil fuels creates greenhouse gas emissions that wrap around the Earth like a blanket, holding the solar body in place and raising the temperature. The examples of greenhouse gases whose emissions cause climate change are carbon dioxide and methane. They are formed, for example, when gasoline is used to drive cars or coal is used to heat buildings. The clearing land and forests can also release carbon dioxide. Landfills are the main source of methane emissions. The main emitters are industry, transport, agriculture and land use.

Discussion

The concentration of greenhouse gases is at its highest level in the last 2 million years. Moreover, emissions continue to rise. As a result, the Earth is now 1.1°C warmer than it was in the late 1800s. The past decade (2011-2020) has been the warmest in the history of the Earth. While many people think that climate change means mostly warmer temperatures, rising temperatures are only the beginning of the story. Since the Earth is a system where everything is interconnected, changes in one area can affect changes in all others.

Currently, the impacts of climate change include, among others, severe droughts, water shortages, severe fires, sea level rise, floods, melting of polar and mountain glaciers, catastrophic storms and loss of biodiversity.

The climate change can affect our health, our ability to grow food, housing, security and work. Some of us are already more vulnerable to the impacts of climate change, such as people living in small island states and other developing countries. Impacts such as sea level rise and salt water intrusion have reached such levels that entire communities have been forced to relocate, and prolonged droughts put people at risk of starvation. In the future, the number of “climate refugees” is expected to increase. This process is also called “climatic migration”.

Today, according to the UN, there are about 25 million refugees in the world due to environmental disasters. In the coming decades, global warming, increasing water scarcity, floods and the reduction of agricultural land will be the decisive factors in migration. Migration flows will be directed all over the world [2. – S. 400]. The World Bank has published an updated version of the Groundswell report, according to which climate change will force about 216 million people to migrate within their country by 2050. The internal climate migration hotspots will emerge as early as 2030 and will spread and intensify until 2050. According to the World Bank, the most difficult situation will be in African countries south of the Sahara - in this region the number of climate migrants will reach 86 million people. In turn, in East Asia and Oceania this figure will be 49 million, in South Asia - 40 million, in North Africa - 19 million, in Latin America - 17 million, and in Eastern Europe and Central Asia - 5 million.

By 2050, up to 5.1 million climate migrants, or 2.3% of the total projected population, could appear in Eastern Europe and Central Asia. Of these, up to 2.4 million migrants will live in Central Asia (on average under the pessimistic baseline scenario). The experts predict that the Fergana Valley (in the territory of Kyrgyzstan, Tajikistan and Uzbekistan), the lands around Tashkent and the lowlands of southern Tajikistan (including Dushanbe), as well as the more densely populated cities of northern Kazakhstan (Karaganda, Astana and Kostanay) will become areas of influx of climate migrants. This is due to the expected increase in water availability and crop yields in these parts of Central Asia, the report notes.

As the experts expect, the areas along the southern border of Kazakhstan, the areas adjacent to the Ferghana Valley in Uzbekistan and Tajikistan, as well as the lands around the city of Bishkek, will become the outflow zones of climate migrants. This is due to projected declines in water availability and crop yields in these parts of the region, the report says. For the same reasons, smaller areas of eastern Turkmenistan and southern Uzbekistan, located along the Amu Darya are also considered as potential outflow zones for climate migrants, experts say. The authors of the report note that immediate and concerted action to reduce greenhouse gas emissions, as well as to support sustainable development, can reduce climate migration by 80%, in which case only 44 million people will have to leave their homes.

As early as 1989, Mustafa Tolba, Executive Director of the UN Environment Programme, stated that “at least 50 million people could become environmental refugees if the world does not support a sustainable development strategy” [15]. In 1990, the Intergovernmental Panel on Climate Change announced that the most serious impact of climate change could be migration with “millions of people fleeing coastline erosion, floods and severe droughts” [11].

In the mid-1990s, British environmentalist Norman Myers became one of the most prominent proponents of this idea, stating that “environmental refugees will soon become the largest group of forced refugees” [12]. He also claimed that in the mid-90s there were 25 million environmental refugees in the world, by 2010 this number will double, and by 2050 it will increase to 200 million [18]. It is evident that the vast majority of migrants due to climate change will fall into poverty and take years to recover. Thus, the number of poor people in the world is increasing. The negative effects of climate change are very devastating. On the threat of climate change to the future of humanity, former UN Secretary-General Ban Ki-moon, in an entry on the End Poverty blog, said: “I have always considered global warming to be an issue of extreme importance. Now, if action is not taken, I believe that we will be on the brink of disaster.”

Every additional degree of global warming matters. In a 2018 United Nations report, thousands of scientists and government experts agreed that limiting global temperature rise to no more than 1.5°C would help us avoid the worst climate impacts and maintain a livable climate. However, according to current national climate plans, global warming is expected to reach 2.7°C by the end of the century.

Although, the climate change-causing emissions occur in all regions of the world and affect everyone, some countries produce much more of them than others. While the top 100 emitting countries account for 3 percent of total emissions, the top 10 emitting countries account for 68 percent. While taking action on climate change is everyone's business, the peoples and countries that create more problems must take on more responsibility and act first.

The climate change is one of the development issues. In view of the possible impact of this phenomenon on many aspects of human life, today it is probably one of the most important development issues. Rich, long-industrialized countries bear the brunt of the climate change problem, while the poorest communities and countries suffer the most as they tend to bear the brunt of severe floods, droughts, storms and other predictable phenomena, the means to effectively combat which they do not have enough. In fact, climate change, which leaves people in poverty can lead to the loss what has been achieved in the field of world development. For instance, human-induced climate change can lead to:

- Reduced crop yields. It is projected to decrease by 30% by 2050, in particular due to an increase in the average duration of droughts from two (for a 1.5°C rise in temperature) to ten; months (when the temperature rises by 3°C), as well as the loss of working hours under the influence of heat stress [7];
- further reduction in the quantity and quality of water in regions where poor communities depend on rainwater and groundwater for irrigation and drinking;
- the spread of malaria, dengue and other diseases in tropical and subtropical regions (where health care is already poorly developed, there will be an increase in mortality);
- Ecological systems and their biodiversity will be damaged (resulting in reduced service, livelihood and income opportunities);
- Poverty may increase due to drought or floods;
- there will be financial and economic crises (as a result of which millions of people will be unemployed or their monthly wages will be reduced);
- the number of “climate migrants” will increase;
- the wars may arise between states (over the distribution of transboundary rivers and lakes).

In addition, the rise in sea levels caused by the expected increase in temperature could displace tens of millions of people living in low-lying areas such as the Ganges or Nile deltas, as well as jeopardize the existence of small island states. We face a huge challenge, but we already know many solutions. Many climate change solutions can not only be cost effective, but also improve our lives and protect the environment. We also have global structures and agreements underpinning efforts to achieve progress, such as the Sustainable Development Goals, the United Nations Framework Convention on Climate Change and the Paris Agreement. There are three broad categories of action: reducing emissions, adapting to the effects of climate change, and financing necessary adaptation measures.

The switching energy systems from fossil fuels to renewable energy sources such as the sun, tides or wind will reduce emissions that cause climate change. But you need to start right now. Despite an expanding coalition of countries committed to achieving net zero emissions by 2050, about half of the emission reductions need to be implemented by 2030 to keep warming below 1.5°C. Between 2020 and 2030, fossil fuel production should decline by about 6 percent per year.

We must realize now that the effects of climate change will then be difficult to control and manage, and take serious action against them, otherwise, it will be too late. Measures to combat climate change require significant financial investments. However, inaction on climate is much more costly. One of the most important steps is for the industrialized countries to fulfill their commitment to provide \$100 billion a year to developing countries so that they can adapt and move towards a greener economy.

Today, the world community recognizes that climate change will negatively affect the poorest segments of the population, and scientists, politicians and various societies are trying to solve this problem, acting in several directions.

Adaptation

The adaptation involves taking action in response to the effects of climate change. This includes improving education, awareness and training on the impacts of climate change, as well as taking action such as planting drought-tolerant plants and strengthening coastal protection. People's ability to adapt to change depends on their level of income, health, access to safe housing, support from social services, and local government policies. The good development policies must take into account adaptation needs, and countries are increasingly guided by such policies. Climate change is already endangering the lives, health and livelihoods of hundreds of millions of people who lack the financial, technical and organizational resources to adapt.

The first important step towards adaptation is determining who is affected and in what form. Such information supports strategic planning for adaptation at all levels, from global to local.

The Climate Change Mitigation

The climate change mitigation is a term used in climatology to cover actions taken to reduce or remove greenhouse gases from the atmosphere. We can reduce greenhouse gas emissions if we reduce the use of fossil fuels for energy production and turn to alternative energy sources such as solar, wind and water power. Trees remove carbon dioxide from the atmosphere and absorb carbon, so afforestation is very important. Unfortunately, the deforestation leads to the re-emission of carbon into the atmosphere, which is one of the main reasons that high carbon content in the atmosphere is a serious problem today.

Although, the developed countries bear a large share of the blame for climate change, the rapid process of industrialization in developing countries, which has created a need for deforestation and the use of fossil fuels, has led to an increase in the amount of greenhouse gases produced by these countries. Today, developing countries face a difficult task: they must continue the development of industry and development in general, without repeating the mistakes of today's industrialized countries, i.e. not causing irreparable damage to the environment.

Each of us, no matter where we live, can help tackle climate change by reducing carbon emissions in our daily lives. For example, we can recycle waste, walk or ride a bike instead of using a car, turn off unused electrical appliances from the mains, and this is only a small part of what can be done. At first glance, these are small steps, but they are really important, especially if this is done in all communities. The dissemination of information is another important means of influence. Many people do not realize the seriousness of the climate change problem, and perhaps raising awareness will also spur them to action.

The global warming on the planet will cause large areas of permafrost to thaw. In these areas, the risks of man-made emergencies will increase significantly. Possible global climate change will adversely affect human health in many countries [4. – S. 240].

Solving the problems of the ecological state of the Earth has become one of the most important tasks of almost all states. International conferences, forums and other types of meetings play a big role in positive climate change. In solving the problem of climate change and its consequences, the role of international conferences known as COP is growing every year.

COP is the name of the annual United Nations climate change conference taking place in Sharm el-Sheikh (Egypt) in 2022. During the summit, the participating countries presented updated emission reduction plans that would be in line with the goal of preventing global temperatures from rising by more than 1.5 °C by 2100.

The representatives of almost 200 states gathered in Egypt. At the start of the climate conference, the World Meteorological Organization (WMO) released its preliminary annual report on the state of the world climate:

- the global temperature in 2022 will be about 1.15°C higher than before the industrial revolution;
- the observers do not expect any revolutionary progress, as Russia's special operation in Ukraine or the Taiwan dispute between the US and China are a burden on international diplomacy.

For the first time, the issue of compensation will be on the agenda. They plan to pay them to countries that have suffered "permanent losses and irreparable damage" due to the climate crisis. These are mainly regions of the Global South (Latin America, Africa, Asia and Oceania). The countries participating in the summit discussed the form of payment of compensation, and by the end of COP27, a special fund may be created.

Recall that after Egypt was chosen to host the UN conference on climate change COP27 in Sharm el-Sheikh in November 2022, and the UAE - COP28 in November 2023, the Arab countries stepped up their position on combating climate change. The abbreviation COP stands for Conference of Parties, while the number (COP1, COP26, COP27) indicates the number of years they have been held since the first meeting in Berlin in 1995.

At the moment, COP is the only global forum where representatives of states from all over the world gather to discuss the climate crisis and possible actions related to the United Nations Framework Convention on Climate Change (a UN treaty signed by 197 countries in the fight against climate change). This year, countries, especially major polluters, need to commit to significant emission reductions.

At the conference, not only plans are presented, but sometimes agreements are also signed. Some governments act as support along with representatives of small island states that may disappear from the map already this century and whose voice is often not heard against the backdrop of economic leaders. Their support is especially needed for work on the climate crisis.

Each COP has a different agenda, but Glasgow (COP26) is the most significant global climate conference since Paris COP21 in 2015. It was then that most countries finally committed themselves to ensuring a safe and stable climate, keeping the temperature increase within 1.5 ° C compared to the second half of the 19th century.

The Climate Change Conference held in Paris from November 30 to December 12, 2015 has become one of the largest international events, and the agreement adopted at it and later approved at the UN World Climate Conference is historic. This document is intended to actually replace the Kyoto Protocol, an international agreement adopted in Kyoto (Japan) in December 1997 in addition to the UN Framework Convention on Climate Change, which obliges developed countries and countries with economies in transition to reduce or stabilize greenhouse gas emissions.

The aim of this conference is to reach, for the first time, a universal and binding agreement to effectively combat climate change and accelerate the transition to a low carbon society and economy. To this end, the agreement, which is expected to enter into force in 2020, should lead to the reduction of greenhouse gas emissions and the adaptation of companies to climate change - present and future [1,90]. In essence, COP26 is the “final” conference where governments must present their emission reduction plans so that we can still stay within 1.5°C.

Many countries have already outlined their plans to cut emissions and keep temperature rises below 1.5°C, but looking at their performance it becomes clear how far this is from what needs to be done in the face of a growing crisis. A recent UN science report contains a warning from scientists about a very bleak future (increasing all anomalous extremes and more) unless we take serious steps soon. Glasgow is the place where these big plans must be approved and launched. But you need to act now!

Just seven years ago, the COP21 conference in Paris brought the world a global climate agreement with the goal of getting out of the crisis. The time has come to implement it and take the necessary measures. The climate conference can be the catalyst for the climate change action we desperately need. To be honest, to date, more than 100 major conferences and meetings have been held, dedicated not only to climate change, but also to environmental problems. But the nature of our planet is still not improving.

For example, despite the fact that twenty years between the UN conferences in Stockholm (1972) and in Rio de Janeiro (1992) 1.2 trillion dollars was spent on environmental protection, the ecological situation on Earth is deteriorating [5].

In conclusion, it should be emphasized that as a result of climate change, economic crises have occurred in many countries, resulting in rising levels of poverty. We will explain this with data and figures below.

1. More than 100 million extremely poor people in Africa are at risk from accelerating climate change, which could also cause the continent's glaciers to melt within two decades, a UN report says. The African Union Commission on Rural Economy and Agriculture estimates that up to 118 million extremely poor people will be affected by drought, floods and extreme heat in Africa by 2030, if adequate responses are not taken.

According to a report coordinated by the World Meteorological Organization (WMO), the extremely poor are those who live on less than \$1.90 a day. In sub-Saharan Africa, climate change could further reduce gross domestic product by 3 percent by 2050. In 2020, Africa's land and water warmed faster than the global average. The 30-year warming trend from 1991 to 2020 was higher than the 1961-1990 period in all regions of Africa and "significantly higher" than the 1931-1960 trend. The rate of sea level rise along the tropical coasts and the South Atlantic Ocean, as well as along the Indian Ocean, was higher than the world average. If this continues, it will lead to a complete decrease in the ice cover by the 2040s [22]. On the African continent, the rise in poverty as a result of climate change is particularly noticeable in the country of Madagascar.

Madagascar, the fourth largest island in the world, has a unique ecosystem - it is formed by animals and plants that are not found anywhere else on our planet. The dry season usually lasts here from May to October, and in November the rainy season begins, but global climate change has completely disrupted the cycle familiar to local residents. It is obvious that precipitation has become much less on the island. When it starts to rain, the locals have hope, but then it turns out that it's just a short rain, after which it will be dry again. And so it goes on year after year, so people now have nothing to replenish their food supplies.”

The four years of drought, the worst in decades, along with deforestation caused by burning or clearing trees for charcoal or reclaiming land for agriculture has turned the area into a dusty bowl. The climate tragedy of the island state is mentioned in an article published on the website of the Reuters news agency. The island state of 30 million has always been known for extreme weather events, but scientists say they are likely to increase in frequency and severity as anthropogenic climate change pushes temperatures up. According to UN climatologists, Madagascar is already experiencing increased aridity. Experts predict that droughts will only intensify.

In the midst of a food crisis, the island risks facing "the world's first famine due to climate change". The residents of Madagascar say that Madagascar used to be called the "green" island, but, unfortunately, now it is more of a "red" island. More than a million people in southern Madagascar are desperately trying to survive the first-ever famine caused by global climate change, according to the World Food Programme. This region has been significantly affected by the drought that has lasted for several years. In southern Madagascar, the UN and its partners are helping hundreds of thousands of local people. There are villages surrounded by dry fields, and tomato beds that were "completely yellow or even brown" due to lack of moisture.

In some areas, people can still grow something, but more and more difficulties have to be overcome every year. In other areas of the island, absolutely nothing grows now, so people survive by eating locusts, fruits and cactus leaves. The leaves of the cactus were previously only used as cattle feed, they were never eaten by humans. The situation is aggravated by the fact that under the current weather conditions, even cacti are gradually dying from drought. To survive, people give up their own agricultural production, sell cattle, fields and even their homes, which completely breaks the lifestyle of thousands of local communities. The World Food Program, in collaboration with humanitarian partners and the government of Madagascar, is helping the country in two main ways. First, about 700,000 islanders are already receiving the food assistance they need to live, including special foods that prevent malnutrition.

The second area includes long-term measures to enable local communities to better prepare for climate shocks, respond more effectively to them and recover faster. In particular, specialists are engaged in the construction of irrigation canals, reforestation and even micro-insurance to help farmers recover from crop losses. If left as is, the number of hungry people will grow exponentially in the coming years. The main objective of the World Food Program at the moment is to provide support to approximately one million inhabitants. "In addition, the UN is seeking to engage partners to fund solutions to enable rural communities in Madagascar to adapt to the impacts of climate change."

2. In Southeast Asia, coastal cities will suffer from the adverse effects of climate change.

The 30 cm rise in sea level, which could occur by 2040 if not vigorously addressed, will lead to large-scale flooding of large cities, and lowland crop areas will be flooded with salt water, leading to the death of crops. Particularly affected by sea level rise is a section of Vietnam's territory in the Mekong Delta, one of the world's centers for growing rice. A sea level rise of 30 cm will lead to a loss of about 11% of agricultural production. At the same time, an increase in the intensity of storms is likely.

The problem of increasing ocean acidification, which will lead to the disappearance of coral reefs and the benefits associated with them: the destruction of fish habitats, natural barriers that protect the coast from storms, a drop in tourism revenues. As a result of rising temperatures and destruction of fish habitats, marine fish catches in the southern Philippines will be reduced by about 50%. This, in turn, creates poverty among the population.

3. According to the study, the main symptom of climate change in South Asia is water scarcity in some areas and excess in others.

The variable monsoon rain patterns and extreme heat will adversely affect crop yields. Reduced snowmelt and snowwater from the Himalayas will reduce the flow of water to the Indus, Ganges and Brahmaputra basins. Taken together, these changes could lead to hundreds of millions of people suffering from water and food shortages and power outages. Bangladesh, as well as the Indian cities of Kolkata and Mumbai, will face such problems as an increase in the intensity of floods and the strength of cyclones, rising sea levels, and rising air temperatures.



Photo by UNICEF/A. Zaidi. Due to heavy monsoon rains, a third of the territory of Pakistan was covered with water, thousands of houses were destroyed. The climate change will dramatically increase the number of poor people in this region.

4. Impacts of extreme weather events and climate change, including megadrought, extreme rainfall, land and sea heatwaves and melting glaciers, are affecting Latin America and the Caribbean, from the Amazon to the Andes and from the waters of the Pacific and Atlantic Oceans to the snow depths Patagonia.

The 2021 State of the Climate in Latin America and the Caribbean report by the World Meteorological Organization (WMO) highlights the far-reaching implications for ecosystems, food and water security, human health and poverty.

The rate of deforestation has been the highest since 2009, hitting both the environment and efforts to prevent climate change. The Andean glaciers have lost more than 30 percent of their area in less than 50 years. "Megadrought in Central Chile" is the longest in at least the last 1000 years. If this situation continues, the poverty in the region could rise sharply in the coming years.

In conclusion, it should be noted that the number of poor people in the world is increasing not only because of financial and economic crises, but also because of geographical factors including climate change and natural geographic processes.

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