LFFU in biodiverse hotspots of developing countries

Carlos Larrea Maldonado

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LEAVING FOSSIL FUELS UNDERGROUND

DEJANDO EL CRUDO BAJO TIERRA

INNOVATIVE TOOLS FOR SUPPLY-SIDE MITIGATION

LFFU IN BIODIVERSE HOTSPOTS OF DEVELOPING COUNTRIES

By: Carlos Larrea

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UNIVERSIDAD ANDINA SIMÓN BOLÍVAR Ecuador 30 años

Unidad de Información Socio Ambiental
Universidad Andina Simón Bolívar - Ecuador

UNIVERSITY OF AMSTERDAM

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LFFU in biodiverse hotspots of developing countries

This lecture discusses a tool to expand the mitigation procedures because ways to keep reserves unexploited are urgently needed.

(a) We discuss the demand-side mitigation suggested in the Kyoto Protocol and the Paris agreement, which has been insufficient to avoid the catastrophic effects of climate change.

(b) We refer to the argument that two-thirds of fossil fuel reserves must be underground and unexploited to fulfill the Paris agreement goals.

However, no criterion exists yet to define which reserves could remain exploited and which must remain underground.

We will focus on fossil fuel reserves located beneath biodiversity hotspots in developing countries, aiming to strengthen the idea that these reserves must be considered unburnable. Fundamentally, they have the highest extraction cost not only from the perspective of the productive destruction cost but also because of the externalities linked to biodiversity destruction.

Biodiverse hotspots of developing countries

The Yasuni-ITT initiative is the most important precedent for designing an innovative tool that helps to promote keeping biodiversity hotspots in developing countries unburnable. This initiative is the first and is still the only International agreement to keep fossil fuels underground in a vast reserve. This reserve is located in the Ecuadorian Amazon.

Although the initiative was canceled, it is still a very interesting model that can be applied and replicated in the future.

First, it is crucial to understand why we need new tools to keep the Paris Agreement goals and avoid climate change's catastrophic effects. Figure 1 shows the evolution of carbon dioxide concentration in the atmosphere since 1985. An ascending trend is evident. The concentrations are above the safe limit agreed upon for the Earth's capacity.

The 350 parts per million (ppm) is the highest concentration value that allows compensation for human-made emissions. Nowadays, the concentration is significantly higher than the limit; it is above 415 ppm and is still ascending. There are no signs of decline or a reduction in this ascending trend. The problem of greenhouse gas concentration in the atmosphere is complicated to reverse.

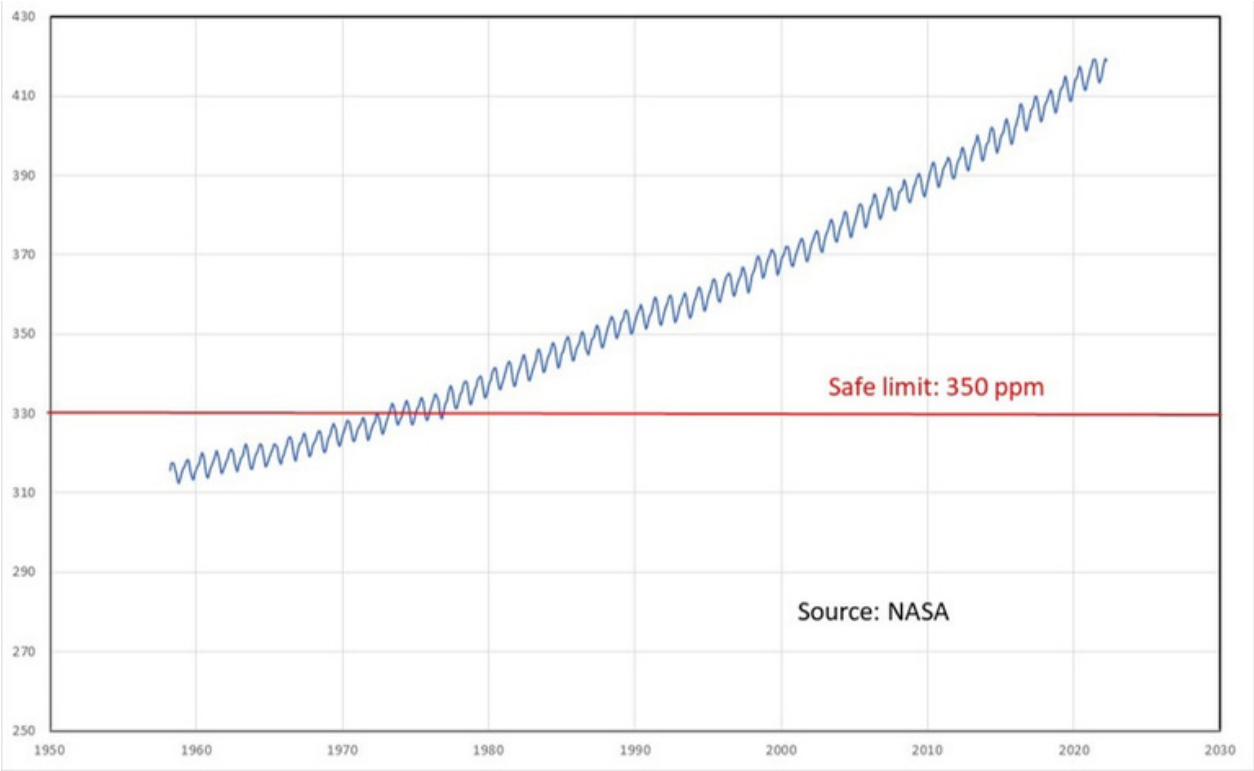
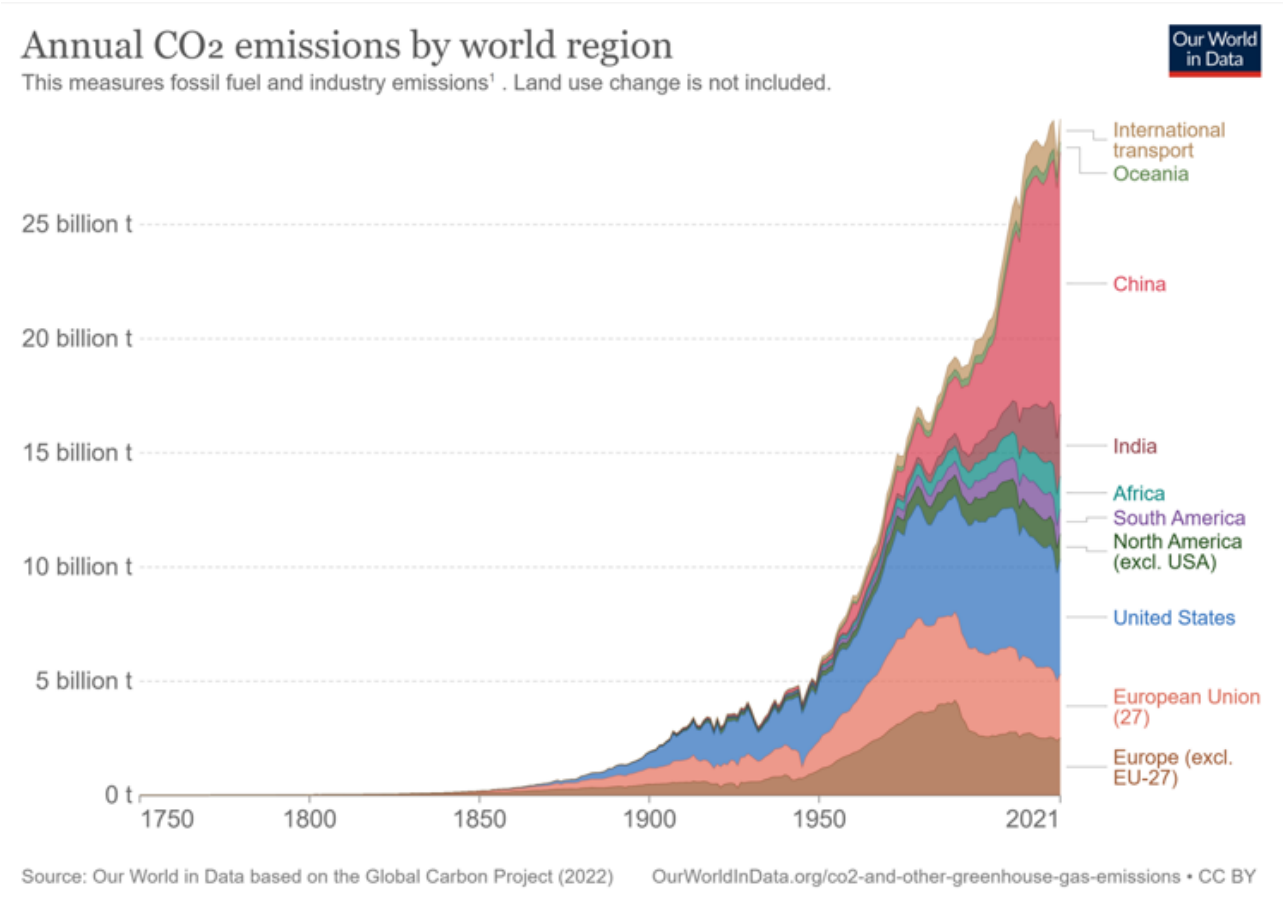


Figure 2 shows the evolution of carbon dioxide concentrations since the Industrial Revolution. There are depicted the different contributions of carbon dioxide per country. The high increment of gas emissions is more evident after the second world war, approximately since the 1950s. It is essential to analyze from the figure that the concentrations are close to reaching a plateau because it seems that they are not increasing anymore. However, it remains unclear whether this year's emissions are still growing slowly.

The problem is that despite the efforts of some countries to decline emissions, the concentrations are still extremely high. Countries like China, India, and other developing nations are not reducing emissions; therefore, the problem is still out of control.



Mitigation policies are not on track to fulfill the Paris Agreement.

Reflecting on the latest information about the Paris agreement goals, figure 3 shows the historical evolution of greenhouse gas emissions and plots three future scenarios.

- **Business-as-usual policies:** we end up with global warming between 2.5 and 3°C which will be catastrophic for our civilization
- **National commitments will be fulfilled,** including conditional pledges. In this case, the planet ends with a global warming of about 2.1°C, which is still above the Paris Agreement goals.
- **We must follow the path** to fulfilling the Paris Agreement goals. However, it is easy to observe a vast gap between current commitments and the necessary reductions

So, if we continue with the current path, and even if we fulfill the pledges, the world will still produce 50 gigatons of emissions. We need only half of that to achieve the Paris Agreement goals.

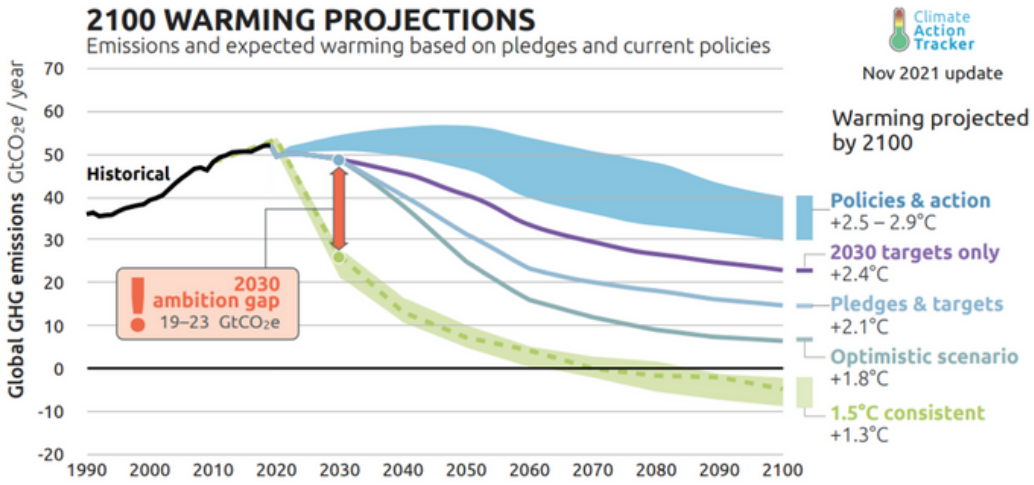


Figure 2 Global greenhouse gas emission pathways for CAT estimates of policies and action, 2030 targets only, 2030 and binding long-term targets and an optimistic pathway based on net zero targets of over 140 countries in comparison to a 1.5°C consistent pathway.

The gap is incredibly high, we need to be on track, but we are still far

Current mitigation tools are insufficient.

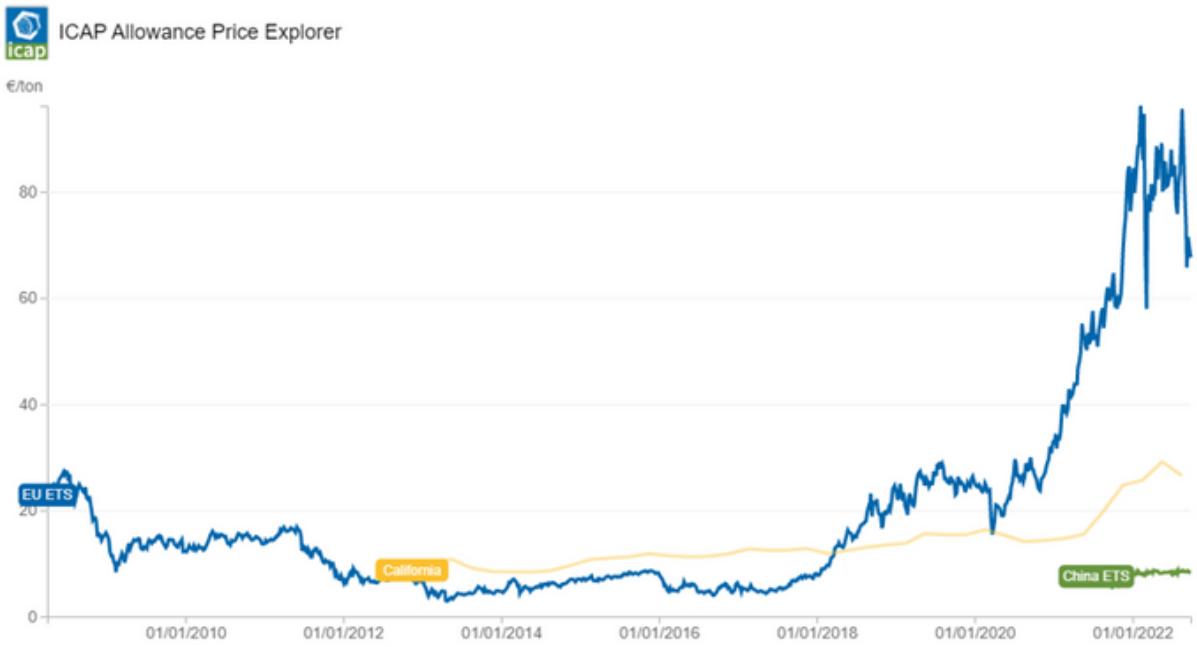
It is crucial to understand that more than the current mitigation tools are needed. Considering what has been applied to fulfill the Paris Agreement and the Kyoto Protocol, they are primarily demand-side policies, namely carbon credits. The carbon market and carbon tax have been used to a lesser extent.

The problem is that carbon pricing tools have been volatile and often at low prices. Also, carbon pricing and carbon taxes consider only 21 percent of global carbon dioxide emissions. That means that most emissions are not tackled by any demand-side mitigation tool. In addition, only four percent of carbon pricing instruments could effectively meet the Paris Agreement goals. Thus, demand-side mitigation has been very limited as the primary mitigation tool.

Carbon prices in European Emission Trading System (ETS)

Figure 4 shows the fluctuation of carbon prices in the European Emission Trading System. Since the beginning of the European Union ETS, carbon prices have been around 20 Euro per ton, then they declined, and after the financial crisis in 2008, they collapsed to below 10 Euro. The prices are recovering fast, although the Ukrainian War has negatively affected them.

They are considered high, but this is only the case for the EU ETS. The Californian Market is also important and affected mainly by meager prices. The recent expansion of carbon trading in China has the same results; it is strongly influenced by prices that are so low that it is not effective as a mitigation tool.



Regional distribution of fossil fuels

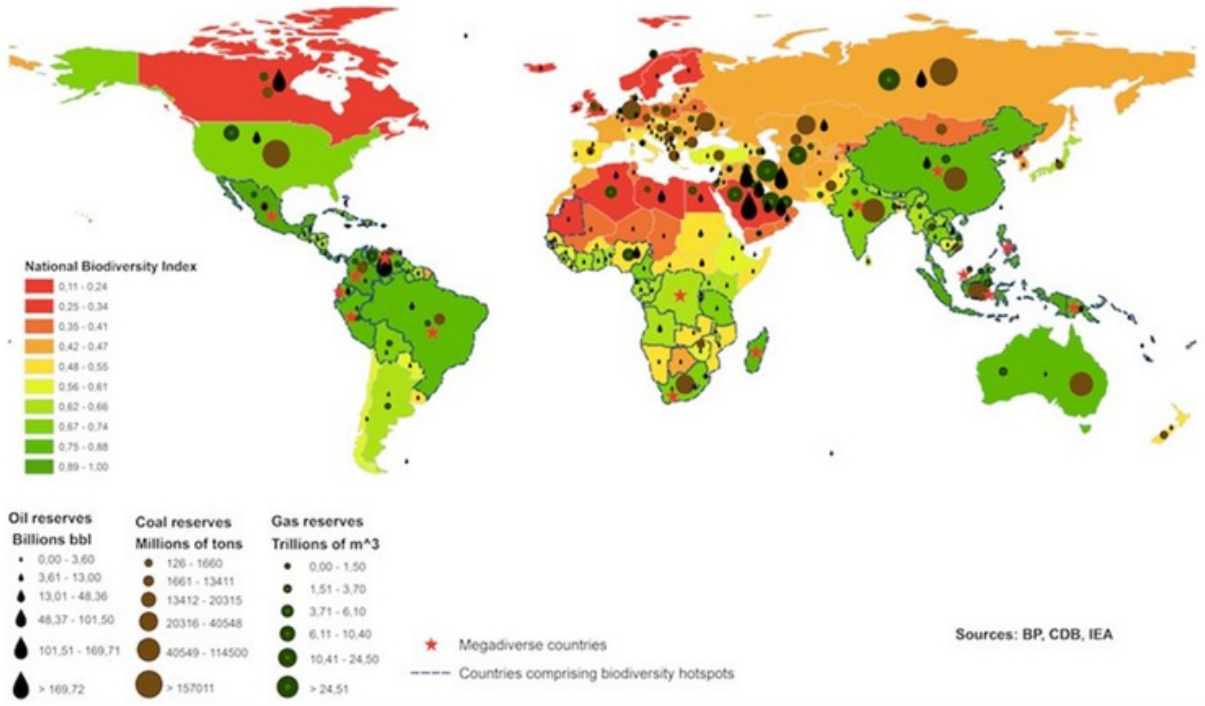
Having demonstrated that we need new instruments and policies to provide hope in the future to fulfill the Paris Agreement goals, we will analyze the reasons why we need to leave fossil fuels underground. At least two-thirds of fossil fuel reserves must be kept underground if we want to stay below 1.5°C.

Reserves to remain unexploited

- 43 percent of oil reserves
- 50 percent of gas reserves
- 88 percent of coal reserves

Despite this being a vital scientific fact, we need more tools and international agreements to define which reserves may be exploited and which not.

However, there is an evident overlap between biodiverse hotspots and fossil fuel reserves. In Figure 5, the map shows places with very low biodiversity in red such as the Sahara Desert and areas with very high biodiversity in green. Here we can highlight the biodiversity of the Amazonian Basin, China, and Australia.



The circles indicate the amount of coal, oil, and gas reserves. Thus, it is clear that many of the remaining reserves are under biodiversity hotspots like Ecuador, Perú, Colombia, and Venezuela. Developing mega-diverse countries retain about one-quarter (24.3 percent) of all fossil fuel reserves on the planet. So, we need a tool to uphold the structure of biodiversity, mitigate the adverse and strong environmental effects of fossil fuel extraction, and reduce carbon emissions.

This is key to advancing the idea of keeping fossil fuels underground.

Yasuni – ITT initiative structure

(International Fund to keep fossil fuels underground in developing countries)

The ITT initiative is the only agreement that exists until now to keep fossil fuels underground in the Amazon basin. This vast oil reserve lies within the Yasuní National Park in Ecuador. With the signing of the agreement in 2007, the country was committed to leaving the ITT Reserves indefinitely underground and unexploited, with the condition that the United Nations create an international compensation fund. President Rafael Correa canceled the agreement in 2013.

The main idea was that some higher-income countries finance the fund and transfer resources and opportunities to developing nations to meet the agreed objectives. Ecuador would commit to investing the funds in sustainable projects such as:

- Renewable energy
- Biodiversity conservation
- Equitable social development in the Amazon region
- Improvement of energy efficiency

The country has been a critical oil exporter country in South America. Therefore, the agreement is essential to foster the diversification of Ecuador's economy away from fossil fuels and reduce the country's dependency on them.

The ITT initiative has some critical points that should be considered as a baseline for new international agreements to keep fossil fuel reserves in developing countries unexploited.

Some ideas to achieve similar agreements are:

- Alliances between wealthy countries
- Alliances with international financial institutions, such as the World Bank, private banks, or bilateral financial institutions.
- Developing countries willing to leave fossil fuels underground if they receive compensation

This type of agreement is compatible with Article 6 of the Paris Agreement, which allows countries to associate to address mitigation tools in the future.

International tool for keeping fossil fuels underground

There are some very recent cases of initial steps toward applying this proposal.

South Africa has large coal reserves and is one of the largest coal producers worldwide. It is, therefore, a highly polluted country. The government is about to sign an Energy Transition Partnership with the European Union, the UK, and the US to move away from coal and accelerate its transition to a low-emission economy. In exchange, the wealthy countries in the agreement are willing to create an 8.5 billion dollar fund in grants, investments, and loans to allow this transition.

A similar agreement was announced in November 2022 in **Bali, Indonesia**. They signed a deal with the US, Japan, and other wealthy countries to accelerate the transition from coal. By doing this, they receive economic support of 20 billion dollars. Indonesia is also among the biggest polluters in the world. Thus, this transition might be significant.

Finally, there is a new case in **Colombia**, with the ambitious plan represented by the recently elected president Gustavo Petro. The country is willing to foster a transition to progressively reduce dependence on coal and oil exports, promoting renewable energy. Coal and oil are the two most essential products in the Colombian export basket, so this transition is important. In addition, they have a plan to ban oil exploration using fracking.

The three cases illustrate essential steps in which mega-drivers, developing countries, might receive international compensation as support to move away from their dependence on fossil fuels and shift towards alternative energy sources.

In 1992, the world adopted the **United Nations Framework Convention on Climate Change**. It included a vaguely worded target for industrialized countries to bring back their emissions to 1990 levels by 2000. It was hard to recognize it as a target as the policies were weak.

The Kyoto Protocol negotiations culminated in 1997 and called for reducing the emissions of six greenhouse gases to 5.2 percent below 1990 levels. Although this target was legally binding, the US and Canada did not participate.

The Doha Amendment in 2012 adopted self-selected targets for the industrialized countries for the period 2012-2020; this amendment came into force in 2020 – so late that it did not have an impact in terms of establishing momentum in the regime. The US, Japan, Canada, and some others did not participate in it.

In 2015, the Paris Agreement was finally adopted with a long target to ensure that average global temperatures do not exceed 1.5°C of pre-industrial times. It targets the period beyond 2020 and moves away from the idea that rich countries should take action first.

- During the first three decades of the agreement, North America did not commit to any quantitative target.
- Other rich countries were consequently less motivated to show spectacular leadership in the climate regime.
- It led many developing countries to think that the problem was not as severe and therefore did not demand serious action.
- The tensions between countries in the negotiations will keep growing.

As a result, we are now in an 'overshoot' phase, i.e., we have already emitted too many greenhouse gases, and the window for reaching 1.5°C is closing fast.

The only way to reduce greenhouse gas emissions is by:

- Compensating heavily through planting more trees that absorb greenhouse gas emissions.
- Adopting geoengineering techniques.
- Rising of the net zero target – where countries, cities, and companies claim that although they cannot reach zero emissions, they can reach net zero by compensating for some of their emissions.

However

Many loopholes exist because many of the compensation measures suggested have high risks and may even be impossible physically to achieve.

The idea that rich countries would lead by adopting serious targets to reduce their emissions to enable developing countries to increase their emissions has not been met so far.

Assignment

What do you think of the net zero targets?

Summary

The Climate Change Convention of the United Nations included five principles: (1) the precautionary principle, (2) the right to (promote) sustainable development, (3) equity, (4) common but differentiated responsibility and respective capability (CDBRRC), and (5) open and supportive economic system. A principle of not causing harm to others or a principle to compensate for damages does not exist.

The Kyoto Protocol did not adopt any principles, and the Paris Agreement did not have a section on principles. The latter does discuss the right to development and the CBDRRC principle. Still, the implementation of equity ideas in the regime is minimal.

To date, there is still a gap regarding specific targets and timetables. However, there is some consideration of policies to develop a series of market mechanisms like joint implementation, emissions trading, clean energy, and reducing emissions from deforestation and forest degradation (REDD).

The hope, in the beginning, was that these market mechanisms would unleash a change in the use of fossil fuels. It did not work out as the price of fossil fuels fluctuated, creating new waves of opportunity for those who wanted to profit from this sector.

Some plans to consider other instruments like reporting mechanisms, transparency mechanisms, loss, and damage articles exist, but it is still unclear whether these are enough to meet the 1.5-2℃ objective.

Conclusions

Rich and developing countries need to reduce greenhouse gas emissions rapidly, but the strategies must be according to the realities of each country. In other words, countries from the south cannot follow the steps of the countries from the north. They have to find their path towards sustainability individually.

Aspiring to western development patterns, lifestyles, and western technologies is not going to help these countries out of the crises they will face due to climate change.

There is growing evidence that time is running out. We must urgently phase out fossil fuels and arrest and reverse land use changes worldwide if we are to maintain the planet at a safe level.

The rich and powerful worldwide have used up most of the emission space. On the other hand, developing countries and people have used relatively little of the emission space and have massive fossil fuel reserves.

Without an urgent and globally just approach to redefining development and taking responsibility for past emissions, it will be difficult to address climate change.