

International Inaugural Dialogue Event Report

Scaling Up Climate Action in Eurasia: Carbon Farming and Trading

October 3, 2022, Astana, Kazakhstan



Supported by the Government
of the Republic of Kazakhstan





First panel speakers (top) and audience members (bottom) at the AIFC, Astana



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Executive Summary

Agriculture poses a great challenge for CO₂ emission reductions, but it could also provide the key solution in achieving this global objective. To discuss the establishment of such carbon offsetting systems in the agricultural sector, International Institute of Applied Systems Analysis (IIASA) co-organized an international inaugural dialogue on Scaling up Climate Action in Eurasia: Carbon Farming and Trading, alongside the BRICS Competition Law and Policy Center, TALAP Center for Applied Research, National ESG Club, and Green Finance Center (GFC) which took place on 3 October 2022 at the Astana International Financial Center (AIFC), Kazakhstan.

The dialogue was endorsed by the Ministry of Trade and Integration, and the Ministry of Agriculture, of the Republic of Kazakhstan (RK). It counted on the participation of Serik Zhumangarin, Deputy Prime Minister and the Minister of Trade and Integration of RK. The dialogue consisted of three panel sessions, connecting key stakeholders in the discussions including regional politicians, private sector experts, and scientists to identify the main opportunities and challenges of implementing a carbon market in Eurasia with a central carbon exchange platform established in Kazakhstan.

The event opened with welcome addresses presented by the leaders representing AIFC and IIASA. Michael Obersteiner followed with his keynote presentation on the forecasting of current emission pathways of Eurasia. In his presentation, Obersteiner highlighted the urgent need for net negative carbon emissions and the various efforts which could be taken in Eurasia including no-till farming and the restoration of grasslands. Later in his presentation, Obersteiner presented on the opportunity and potential economic value generated from the trade of sequestered carbon credits particularly from private industries.

In the first panel, Serik Zhumangarin stressed the importance of integrating the agricultural industries in emission reducing activities and providing farmers with the opportunity to earn revenues from carbon sequestration. Zhumangarin further pointed toward the 80 million hectares of unusable land in Kazakhstan which can be repurposed for carbon sequestration. He concluded by reinforcing the potential of Kazakhstan to becoming a key player in carbon farming markets in Eurasia. Pradeep Monga delivered a presentation based on his leadership experience at the United Nations Convention to Combat Desertification (UNCCD). He focused on the need for climate policies that are inclusive of vulnerable members of society and presented the framework of nature-positive solutions in implementing policies targeting global warming in industry and infrastructure.

The second panel session focused on the advancing carbon farming in Eurasia with experts presenting their insights from Russia, Pakistan, China, and Kazakhstan. The session consisted of presentations on the advancements provided by new satellite and drone technologies for efficiency farming; the simplified tools and farming techniques to improve soil sequestration for small farmers; and the successful case studies of climate-forward actions interwoven into the planning and policies of Chinese cities.

The final panel session consisted of experts in the field of competition law and sustainability development, who delivered their thoughts on the changes in the field of sustainability law, Corporate Social Responsibility (CSR), and Environment, Social, Governance (ESG) frameworks, which help to deliver vital improvements in corporate behavior toward environmental objectives, as well as the integration of a functional carbon market in Eurasia.

Across the three panel sessions, major topics of interest were the transparency of verification processes for carbon capture credits which would qualify on international markets, social inclusiveness, and economic welfare of regional communities in carbon sequestration projects, and the enormous carbon sequestration potential of Kazakhstan given its size of abandoned farming land and level of soil degradation from previous farming practices. Time is tight; every opportunity available must be taken to prevent us the climate catastrophe imminent from overshooting the 2C Paris Agreement target. Under increasingly tense global geopolitical, climatic, and economic conditions, Kazakhstan is emerging as a stable haven with a unique ground to explore unconventional agricultural solutions for cutting emissions. IIASA and our partners will continue our efforts to advocate for impactful scientific and diplomatic solutions to the problem of climate change.

Event Program

Opening remarks

Yerbol Karashukeev, Minister of Agriculture of the Republic of Kazakhstan

Aidar Kazybayev, Chairman of the National ESG Club, CEO of AIFC Green Finance Centre

Albert van Jaarsveld, Director General of the International Institute for Applied Systems Analysis (IIASA) (virtual)

Keynote Speech

Michael Obersteiner, Director, Environmental Change Institute, University of Oxford & Principal Research Scholar, International Institute for Applied Systems Analysis (IIASA)

Panel discussion: Challenges and Opportunities of Climate Action: The Eurasian and Global Perspectives

Moderator

Alexey Ivanov, Director, BRICS Competition Law and Policy Centre

Speakers

Serik Zhumangarin, Deputy Prime Minister - Minister of Trade and Integration of the Republic of Kazakhstan

Aidar Kazybayev, Chairman of the National ESG Club, CEO of AIFC Green Finance Centre

Pradeep Monga, Former Deputy Executive Secretary, United Nations Convention to Combat Desertification

Michael Obersteiner, Director, Environmental Change Institute, University of Oxford & Principal Research Scholar, International Institute for Applied Systems Analysis (IIASA)

11.35 - 12.35 Panel discussion: Advancing carbon farming in Eurasia

Moderator

Elena Rovenskaya, Program Director, Advancing Systems Analysis Program, International Institute for Applied Systems Analysis (IIASA)

Speakers

Nikolai Durmanov, Director, Carbon benchmarking site Kaluga's First (virtual)

Abubakr Muhammad, Associate Professor & Chair, Dept. of Electrical Engineering, Lahore University of Management Sciences (LUMS) (virtual)

Saule Moldabaeva, Director, Department of Strategic planning and Analysis, Ministry of Agriculture of the Republic of Kazakhstan

12.35 - 13.35 Panel discussion: Towards a carbon market in Eurasia

Moderator

Elena Rovenskaya, Program Director, Advancing Systems Analysis Program, International Institute for Applied Systems Analysis (IIASA)

Speakers

Shuhong Wu, Professor, School of Nature Conservation, Beijing Forestry University (virtual)

Gulmira Galieva, Head, Non-Carbon Development Directorate, Climate Policy and Green Technologies Department of the Ministry of Ecology, Geology and Natural Resources of Kazakhstan (virtual)

Ettore Maria Lombardi, Professor, School of Law, University of Florence

13.35 Closing of Event

Rakhim Oshakbayev, Director, Centre for Applied Research TALAP

Background

Broadly, carbon farming describes the use of any agricultural efforts which aim to reduce atmospheric CO₂ by sequestering carbon into plant materials and organic matter, reversing land degradation in the process. Actions which aim to reverse degradation of land due to monoculture practices, desertification, and deforestation previously implemented have shown success in regions including Kenya, South Korea, and several other regions. However, less studied carbon farming methods could provide significant benefits, particularly in Central Asia which already boasts large agricultural industries and the right climatic conditions for carbon-capture crops and carbon sinks. Carbon sequestration in agricultural soils, as well as in plant material, could therefore provide environmental restoration of previously exploited agricultural land as well as provide CO₂ offsetting benefits.

Individual success stories of trading sequestered carbon units (DW, 2022) show the potential for organised markets of net-negative emissions. In 2021, the European Union concluded a pilot project in which participating farmers sold credits for the carbon that had been sequestered on their land (DW, 2022). These credits could allow for companies to reach their net-carbon neutrality targets which would otherwise not be possible via emission reductions or permits only whilst also transferring investments to support local farmers economically. Therefore, net-negative emissions trading becomes a natural milestone to Emissions Trading Schemes (ETS); the aim of reducing current GHG emissions in production coincides with the aim of sequestering carbon back into soil and biotic matter (European Commission, 2021).

Carbon sequestration and trading schemes can provide a new, stable income stream for farmers, land managers, and wider rural communities. Firstly, soil sequestration methods of carbon farming replenish soil which has been depleted of key nutrients from continuous monoculture practices and improve its water-holding capacity. By removing CO₂ from the atmosphere and capturing it into biomass and soil, carbon farming can complement efforts to reinstate soil quality and agricultural productivity for other uses in Central Asian regions where agriculture is still a sizable contributor to GDP. This means that farmers can improve yields in other crops, require fewer tillage machinery, and benefit from an overall more fertile and resilient land (DW, 2022; European Commission, 2021).

Carbon farming provides a greater incentive for regional organisations to commit to better irrigation practices, landscape protections, and water quality as the use of pesticides and artificial fertilisers could decline. Broader economic opportunities for rural communities meanwhile could also bring productivity improvements. Regionally, involvement in carbon farming could enable communities to attain diversified employment skills and create jobs within small and medium sized enterprises - particularly if international trading partnerships are established.

The impact of climate change is already felt by Central Asian regions. Temperatures, as a result of climate change, are set to rise faster in Kazakhstan and neighbouring regions than other regions in Asia. The region faces threats of melting glaciers, severe droughts, desertification, and agricultural economic losses due to climate change. (World Bank Group, 2021). Given the stakes, it is imperative that Central Asia takes adequate steps in mitigating the risks they face due to climate change which are also economically viable. Land and agriculture will play a critical role in climate mitigation actions in the coming years. Already, the World Bank has committed to prioritising investments which facilitate climate-smart economic transitions in Central Asia using agriculture and natural capital as means to strengthen the region's physical preservation and economic development. In this context, the host nation organisers TALAP Center, National ESG Club, and GFC partnered with IIASA and BRICS Competition Law and Policy Center to co-organize the scientific discussion on to promote scientific and political awareness of Kazakhstan's potential in taking on a leading role in carbon farming for Central Asia.

Welcoming Remarks

Aidar Kazybayev

Chairman of the National ESG Club, CEO of AIFC Green Finance Centre



Illustration 1: Aidar Kazybayev delivering his welcoming remarks

Aidar Kazybayev discussed the foundation of the ESG Club which combines the interests of national enterprising leaders who wish to target ESG agenda and promote it in local business and governing processes. ESG Club already has 32 member organizations which seek to involve ESG metrics in all spheres including regulatory practices, corruption mitigation, and improving national employment prospects, and more.

Kazybayev discussed the need to involve agricultural voices in the implementation of ESG policies given that 24% of all global emissions are connected to farming activities as well as the relatively low difficulty of improving emission practices in the sector. He highlighted the potential of Kazakhstan in nurturing innovations for carbon offsetting and trading and the first role of the government in improving the competences of human capital in such operations. Kazakhstan has also investigated the production and trading capacities for biogas and biofuel; however, these

productions also face costly tariffs. Hence it is important to explore ways in which biogas installations can be included in Kazakh capacities of production

Kazybayev further discussed the possibilities of subsidizing carbon farming practices and the means through which the nation can achieve its carbon neutrality targets. He concluded that amidst the global geopolitical tensions, Kazakhstan has presented itself as an island of business stability where business leaders can adopt different ideas, innovations, and knowledge. *"We are ready to attract international experts who have different ideas and failed to implement in other countries, you will be able to adopt them here"*.

Albert van Jaarsveld

Director General of IIASA (virtual)



Illustration 2: Albert van Jaarsveld on IIASA in the welcome opening remarks

In his welcome remark, Albert van Jaarsveld presented on the long-standing engagements between IIASA and Kazakhstan's expert and policy community, such as with the 7-year research project on the challenges and opportunities for economic integration in the European and Eurasian space. He described IIASA, as a child of science diplomacy, as having used its 50 years

of neutral status, convening power, and networks across 22 member countries to tackle difficult science diplomacy matters including transboundary water and energy governance between India and Pakistan, or developing fair allocation of air pollution reduction targets among EU countries. IIASA played an important role in the foundations of the Intergovernmental Panel on Climate Change (IPCC) and more recently, in the setting of the 1.5C Paris Agreement target. Nobel laureate William Nordhaus began his work on the area of carbon markets at IIASA in the early 1970s.

Van Jaarsveld noted "*Climate change is a challenge that requires global cooperation global action and global coalition irrespective of political views of countries and regions we can all coalesce around matters of common interest.*" Speaking of IIASA's own future, he stated its aspiration to remain the go-to destination for policymakers and experts who need solutions for the management of socioecological systems. He concluded by expressing his support for the discussions of the event and the possibilities of further cooperation with Kazakhstan.

Keynote Presentation

Michael Obersteiner

Director, Environmental Change Institute, University of Oxford & Principal Research Scholar, IIASA



Illustration 3: Michael Obersteiner delivering his keynote presentation

Michael Obersteiner began his presentation by stressing the urgent need for carbon sequestration and mitigation projects and the inevitable failure of countries meeting the 1.5C Paris Agreement target pathways within the next 8 years. *"If we continue with our current emissions, which are even increasing, we will soon have no carbon which we are allowed to put into the atmosphere. So, in 2030 if we continue, we will need to stop all CO₂ emissions and start to take CO₂ out of the atmosphere."*

The Need for Negative Emissions

Obersteiner presented the work he led at IIASA on integrated assessment modelling which combines economic scenarios with earth systems to inform policy recommendations and broader mitigation targets. He pointed out the concern that the carbon budget, which is the constraint for

total amount of CO₂ emissions allowed without overstepping the 1.5C Paris Agreement target, is quickly depleting and may likely be surpassed within the next few years.

Yet, emissions keep rising each year since countries still require energy and agriculture; population continues to grow and consume; and intentions of tackling carbon emissions are undermined by the need for economic growth. Obersteiner noted that net-zero emissions targets are not the solution to the problem but a milestone in the longer-term transition to decarbonization, however, this also provides secure and sustainable prospects for the business and trading of negative emissions. By 2080 for example, some forecasts predict a global GDP share of between 2 and 10% just in the sector of negative emissions.

Carbon removal measures

Obersteiner's presentation provided detailed knowledge on the existing carbon farming practices including afforestation, reforestation, and revegetation. Soil carbon sequestration, as previously outlined, involves increasing carbon levels in soil – achieved through conservation practices such as non-tillage farming, or turning cropland into grasslands. Meanwhile, enhanced weathering processes can produce important results, particularly, for diverse terrains such as Kazakhstan. Here, mineral rocks such as basalt are ground and applied directly to agricultural fields which also improves fertility and sequestration.

However, the most favored means of carbon sequestration in voluntary carbon markets (VCM) is the application of coarse biochar into degraded soil which increases the soil's microbial activity, water retention capacity, as well as overall fertility. Combined with silica or rock powder, biochar can greatly improve soil degradation. Similarly, residual CO₂ collected from wood-burning in chimneys can be compressed and sequestered into geological formations, such explorations are being made in the United Kingdom. Such means of sequestration may also be useful for repurposing coal-firing power plants which can be converted into carbon neutral plants via carbon sequestration activities.

Air carbon capture plants were also discussed. Obersteiner acknowledged the expenses involved with such technologies, however, was optimistic that the prices would fall in the coming decades with further innovations and market competitiveness. He predicted that there would be extensive deployment of soil sequestration technologies, including the more expensive air carbon capture methods, by 2050 as demand for new innovations increases. However, he highlighted that the low-effort carbon farming methods would benefit from early demand.

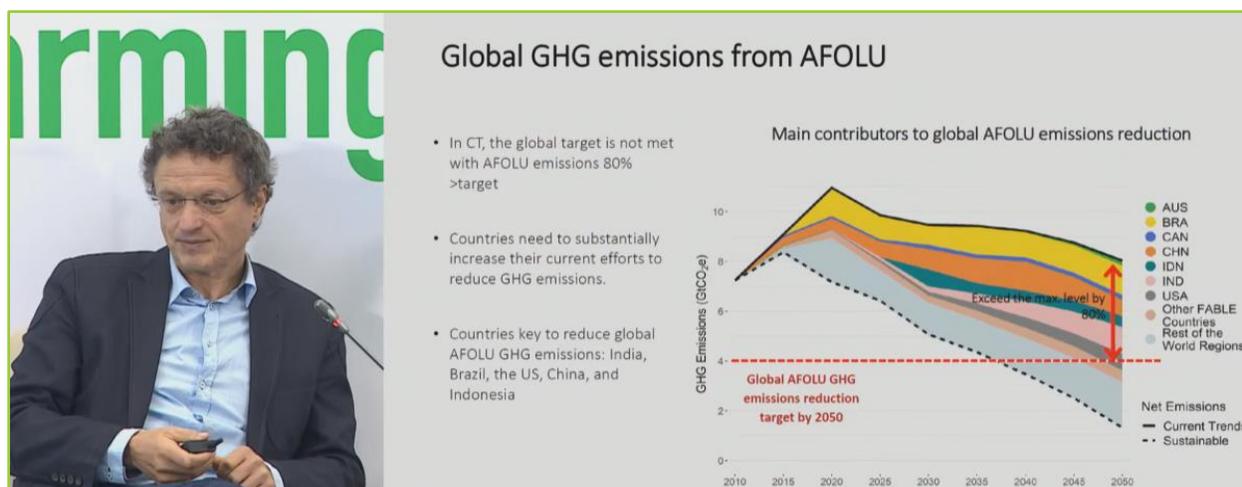


Illustration 4: Michael Obersteiner presenting on the GHG emission forecasts from AFOLU for major economies

Work of FABLE Consortium

The Food, Agriculture, Biodiversity, Land-Use, and Energy (FABLE) Consortium is part of the Food and Land-Use Coalition (FOLU). FABLE Consortium aims to forecast a country's trajectory toward the UN Sustainable Development Goals (UNSDG) as well as the objectives of the Paris Agreement. It is a collective of 20 country teams and involves close partnerships with the United Nations' Sustainable Development Solutions Network (SDSN), IIASA, World Farmers' Organisation (WFO), among several others.

FABLE conducts a 4-step evaluation to develop possible pathways for countries to attain sustainable land-use and food security objectives. Firstly, a thorough assessment is conducted on a country's biodiversity targets, greenhouse gas emissions, existing food production, agricultural trade, water quality and stress management, and pollution levels. Second, national trends and demographics are assessed such as population growth, dietary trends, trading commodities as well as concerns, conservation issues, and the use of technology in food security such as new food production methods.

As a third step, a scenario hackathon is conducted, whereby different pledges of countries are tested against baseline scenarios and national policies are compared on an international scale in terms of restoration, afforestation, and national trade whereby trading relations of countries are harmonized. FABLE sees how countries contribute to meeting the 1.5C Paris Agreement target and identifies countries with food security concerns. Finally, these scenarios are run in a loop for

between two weeks to one month with all countries to forecast if a country's FABLE targets can be met without disturbing trade balances.

Obersteiner presented the most recent findings of FABLE. His work identified sizeable progress of emissions reduction from BRICS countries. He made a distinction between intended carbon sequestration, and sequestration via Russia for example sequesters a third of its own agricultural, forestry, and other land use (AFOLU) emissions, however, most of this sequestration occurs via natural forests rather than policy action. If only policy-enacted emissions reduction is considered, Russia only sequesters 35mn additional tons of CO₂ out of the 2257 bn tons emitted. However, Obersteiner hinted at scope for improvement with greater integration of technology.

Economic Incentives and Challenges for Carbon Farming Trades

VCMs have seen a growing demand from companies trying to deliver on their net zero pledges. However, currently prices of nature-based offsets are high. EU's nature-based offsets are the highest priced at USD \$8 per ton. In his presentation, Obersteiner emphasized the enormous potential of demands in VCM and the subsequent opportunities for price competition for new entrants such as Kazakhstan. He also presented the main challenges, listed below, of setting up carbon farming projects which should be considered:

1. **Additionality:** CO₂ sequestration in soil and vegetation is not permanent, however, temporary carbon credits form a viable option and can be traded at discounted prices.
2. **Aggregation:** CDR projects in sequestration can become costly if they are carried out by individual small farms without aggregated procedures. Instead, carbon farming projects can be bundled whereby
3. **Permanence:** CO₂ in vegetation and soil is not permanently sequestered. However, the sequestered units can be assumed as rental contracts which are sold at discounted prices.
4. **Double counting:** Countries cannot consider sold carbon credits from sequestration projects as part of their own emissions reductions.
5. **Monitoring report and verification:** The process of monitoring, reporting, and verifying carbon sequestration activities requires high time and monetary investments, however, these costs can be reduced through aggregation of procedures.
6. **Vulnerability of carbon:** Carbon is not sequestered permanently, and higher temperatures can increase the rate of loss.

7. Carbon dioxide reduction: Technological components, climate adaptation, and nature-based solutions I.e., carbon farming, all deliver on climate adaptation but can be expensive to fund. Such activities can be funded by green climate funds.

Currently, approximately 20% of VCM profits are transferred to climate adaptation project funds. This presents significant opportunities for carbon farming projects. Combined with food security and water stress management projects, carbon farming can provide stacked benefits which can produce an ecologically sustainable environment longer term.

Concluding his keynote presentation, Obersteiner once again emphasized the potential for Kazakhstan to implement carbon sequestration and farming projects in a way that promotes economic growth, sustainable development of agriculture, and delivers long-term welfare gains for the region long term.

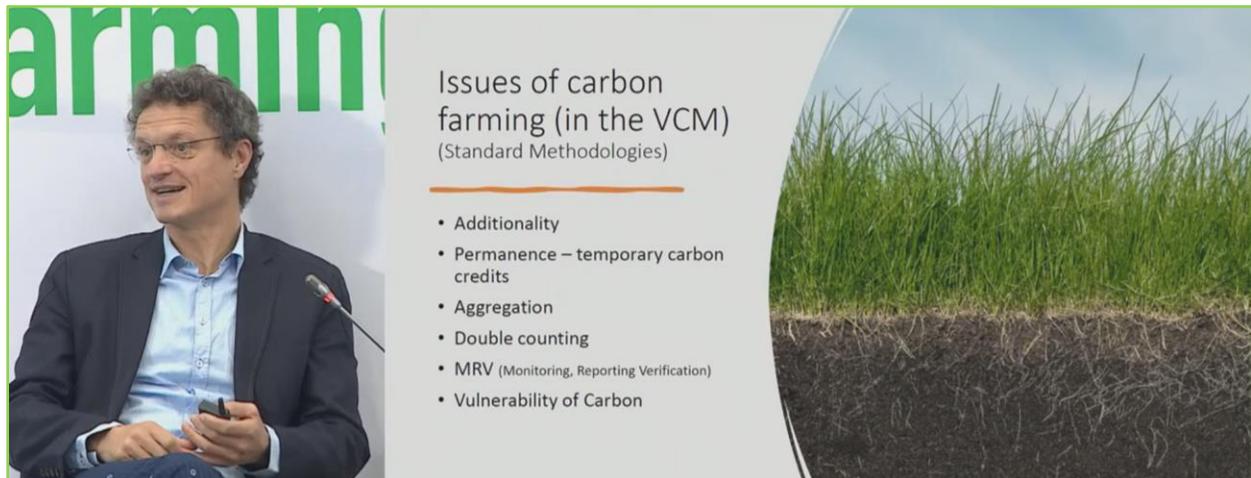


Illustration 5: Michael Obersteiner presenting on the implementation issues of carbon farming for VCM

Panel 1: Challenges and Opportunities of Climate Action: Eurasian and Global Perspectives

Pradeep Monga

Former Deputy Executive Secretary, UNCCD



Illustration 6: Pradeep Monga delivering his presentation on Nature Positive Solutions

The world is close to reaching a global population of 8 bn soon and this is set to reach over 9 bn by 2050. Yet, the land used to accommodate, feed, and provide for these people remains finite. Although climate change is a necessary focus, it should not be considered in isolation. Solutions for biodiversity loss, land degradation, water stress, and food security issues must be considered in conjunction with climate change. This was a key message of Pradeep Monga's presentation.

Having attained outstanding experience as a former Director of Energy Branch at United Nations Industrial Development Organization (UNIDO); in his presentation Monga introduced a term which has gained traction in UN discussions: nature positive. *"If we don't have net zero nature positive, we may fix carbon, but we may need to re-start fixing other climate issues but also the*

livelihood systems on which we exist. When we look at actions, outcomes, and results, please consider this more in totality”.

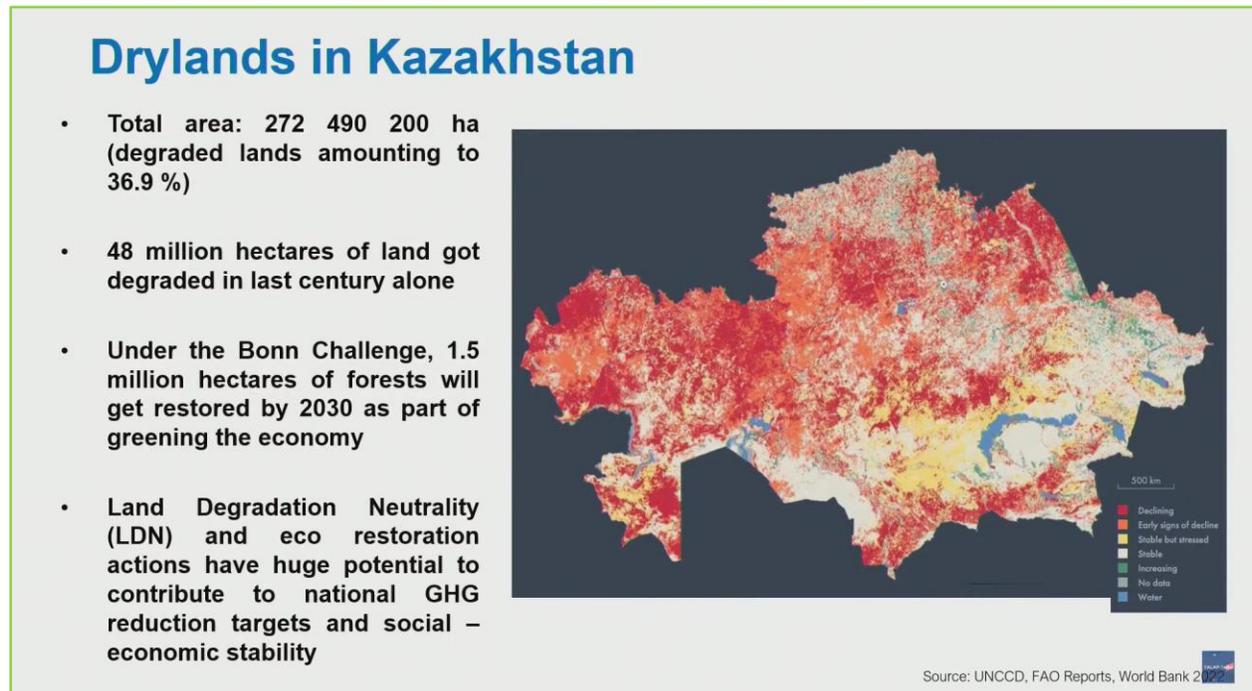


Illustration 7: Pradeep Monga presenting the dryland map of Kazakhstan as of 2022

In terms of land, Monga introduced the audience to the need for a balanced land degradation neutrality (LDN) approach, which aims to anticipate future degradations whilst reversing existing degradation. In 2015, United Nations Convention to Combat Desertification (UNCCD) participants formulated voluntary targets to attain LDN within their national conditions and aims. 129 countries have committed to setting LDN targets, of which over 100 countries have set targets including Kazakhstan. In addition, Monga stressed that the current discussions of land degradation reversals do not grant appropriate inclusion to vulnerable groups of societies such as youth populations, women in rural and urban communities, and minority groups. Thus, LDN approaches are key to putting people first, and using land climate in balancing ecosystem restorations.

Next, Monga presented 5 key messages to consider when implementing carbon farming or any form of ecological restoration projects:

1. Carbon farming and nature positive projects must build capacities, strengthen institutional frameworks, and must importantly promote social inclusivity and benefits. Monga

emphasised that direct investments into carbon farming and nature positive solutions could create jobs and raise income levels for farming communities in the region.

2. New solutions require breaking down siloes. Monga noted that in his 24 years of working with the UN, he had learned the importance of looking at problems beyond individual focal points or institutions. He stated the need for policymakers to take a more holistic approach to tackling problems and to strive for interventions which have plural (nature-positive) outcomes.
3. Kazakhstan could promote regional landscape restorations to ensure multiple benefits and take a leadership role in achieving common markets in Eurasia. This includes free flow of information, knowledge, and improving the skills of institutions in Kazakhstan but also in Central Asia.
4. Scaling up public and private partnerships, sustainable supply chains, and business models which help to unlock innovative climate land finance. Monga pointed out that nature-based solutions span beyond carbon farming initiatives and encompass industries, conservations, agroforestry, and soil restoration from a production point of view. His presentation briefly outlined 2 channels of funding for projects addressing these problems. First, the LDN fund set up by UNCCD which is available for all countries at the national level; as well as sustainable land bonds, in development stage, whereby the profits can be shared with farmers directly.
5. Consider the social impacts of nature-based solutions. *"In UNCCD, we found that every 10 hectares of land restored creates 2 direct jobs. Indirect jobs and sustainable supply chains of agrobusiness will be even larger."* Such jobs can go to women and youth groups. Every USD \$1 invested into land restoration projects can result in up to USD \$10 of income generation. Although such projects require initial aggregators and investments, however, they will become self-sustaining.

In his conclusion, Monga, stressed the importance of integrating the most vulnerable members of society into nature positive solutions and developing indicators for land restoration projects which clarify ownership issues, welfare gains, and equity justices. *"Let me close my comments by challenges ourselves today in this event on how we look at things in a more holistic way on multiple benefits, bringing net zero nature positive ideas and I always say our land, our home, our future."*

Serik Zhumangarin

Deputy Prime Minister and Minister of Trade and Integration of the Republic of Kazakhstan



Illustration 8: Deputy Prime Minister Serik Zhumangarin

Over the years, Deputy PM Serik Zhumangarin has attained outstanding experience in international relations, trading, and competition law in Kazakhstan. His speech was representative of this; he delivered purposeful insights into the growing demand for carbon credits and technologies. Attaining the aim of keeping within the 1.5C target set in the Paris Agreement is impossible without significant measures.

For agriculture, the sector presents a problem in tackling climate change but also hides the solution to the problem. The planting ecosystem is a huge reservoir for CO₂, and it assumes about 30% of emissions caused by human activities. Agriculture typically requires fewer investments relative to other industries when it comes to climate change initiatives given the high potential of carbon sequestration in the region. Although the discussions on carbon farming are nascent; U.S., E.U., and China are a few of the countries already working on pilots of carbon sequestration through farming or afforestation.

Zhumangarin, aligning with Pradeep Monga, stated that the main idea is that farmers receive the revenues for implementing the practices for sequestration activities whether through state-funding and mechanisms or through market mechanisms. Thus, farmers may receive two forms of income, firstly from the crops they grow, and secondly from the sequestration effects of growing these crops. His presentation also highlighted the growing demand for carbon credits and projects from multinational corporations such as Microsoft and Goldman Sachs, and the potential for market entry given the current high pricing of such offsets.

Indeed, the implementation of carbon sequestration increases the soil quality and improves biodiversity whilst providing new income streams for farmers and attracting foreign investments. Therefore, reaching one aim leads to reaching several other aims. Agricultural land cannot be used for other purposes anyhow. As Zhumangarin stressed, Kazakhstan's degraded lands can be used for sequestration where landowners and farmers can be involved. Describing it as a win-win option, Zhumangarin concluded *"I am sure that this conference will become a very important step in the integration of Kazakhstan in the global agenda as a participant that is active and proposes active solutions, the govt of Kazakhstan will be interested in its results especially in line with the COP27 conference where the proposal of carbon farming will be proposed of central Asian countries as a very important benefit in the climate agenda."*



Illustration 9: Speakers of Panel 1

Audience Q&A Session

1. We anticipate COP27 in Egypt next month, we have heard a lot of discussions on the matter, do you think there will be more focus on agriculture pollution on nitrogen oxide – and secondly, do you think UN framework and Paris Agreement will be more inclusive and supportive for carbon farming initiatives to be established in countries like Kazakhstan and Russia which has a lot of spare land.

Michael Obersteiner: *Starting with the second question, firstly the COP meeting in Egypt will have a strong focus on agriculture but also from a climate adaptation point of view. When it comes to this region to participate in carbon farming, this is an underestimated and understudied region. Not only for its potential but also for its soil carbon processes which need to be improved. Kazakhstan is such a large country so even a small contribution per hectare with so much land surface you can get a lot. Also, what needs to be seen is how other technologies such as enhanced weathering works. Also, for rehabilitating very degraded soil which will not only give benefit in terms of carbon but really will enhance fertility of soil and improve competitiveness of the overall agriculture sector.*

2. What do you think of no till technologies and its potential in terms of carbon because there is no such Kazakhstani project?

Michael Obersteiner: *This is a well-established project for voluntary markets and compliance markets especially in the U.S. There are a few scientific doubts about no till but for current markets this is accepted. The amount of co2 sequestered really depends on the degradation state of the current soil. Higher state of degradation will sequester more carbon so if you have soil in a good state then you will not see so much. Hence this is a project proposal for the rehabilitation of more degraded soil so here you see the co benefits with higher yields later. I am not so knowledgeable of degradation state of agricultural soil in Kazakhstan. I gather there are certain problems, but I am aware of a single study that would calculate the potential of how much you can generate in terms of carbon credits.*

3. Unlike neighbouring countries such as India, Kazakhstan has a lot of land, but it is not possible to use them. Developed economies have discussed carbon capture technologies; let us take the free zones in Eurasia which are undervalued assets. To what extent is Kazakhstan interested in this idea and ready to propose it at the level of UN and UNFCCC?

Serik Zhumangarin: *It is not in our direct agenda but nevertheless we are responsible in the ministry for several exchanges and trades. Russia for example launched pilot projects and here we need to launch pilot projects and have a mutual understanding among those who are involved in developing the pilot projects that there is the logic of earning revenues, and at the same time consider that the profitability of the crops will be lower than traditional crops. So, they need to know of additional instruments that will bring additional margin for local farmers. But you are right we need to announce that we start specific type of actions. To present an idea you need to have your own internal content in your territories for us to use as successful cases in presenting the idea.*

Aidar Kazybayev: *I personally know Serik Zhumangarin and his ministry's experiences in dealing with stock exchange trades. We have already attracted for example AIFC, and different banks for carbon farming credits. I think that the breakthrough will be if we develop a clear and transparent carbon unit exchange trade platform to attract air carbon exchange to develop this system here. But we need to first deal with the contingencies of such projects, and then, we need to develop special land plots for forests and those people who will sell offsets. We also need to pay attention to the validation and verification processes of such credits.*

Alexey Ivanov

Director, BRICS Competition Law and Policy Centre



Illustration 10: Alexey Ivanov at the Q&A of Panel 1

Following the Q&A session, Alexey Ivanov presented his concluding remarks on the presentations from the first session. He reminded the audience that carbon farming projects present a great opportunity for business. The ideal arrangement involves the earning of a profit for production, validation and standardisation of the product, demand from buyers, and indeed, as the project expands, it will attract new investors. However, he also encouraged Kazakhstan's early action since this is a first-come, first-served opportunity for which the consequences should be positive for the country.

Panel 2: Advancing Carbon Farming in Eurasia (Hybrid)



Illustration 11: Elena Rovenskaya (right) introducing members of Panel 2

Nikolai Durmanov

Director, Carbon benchmarking site Kaluga's First (virtual)

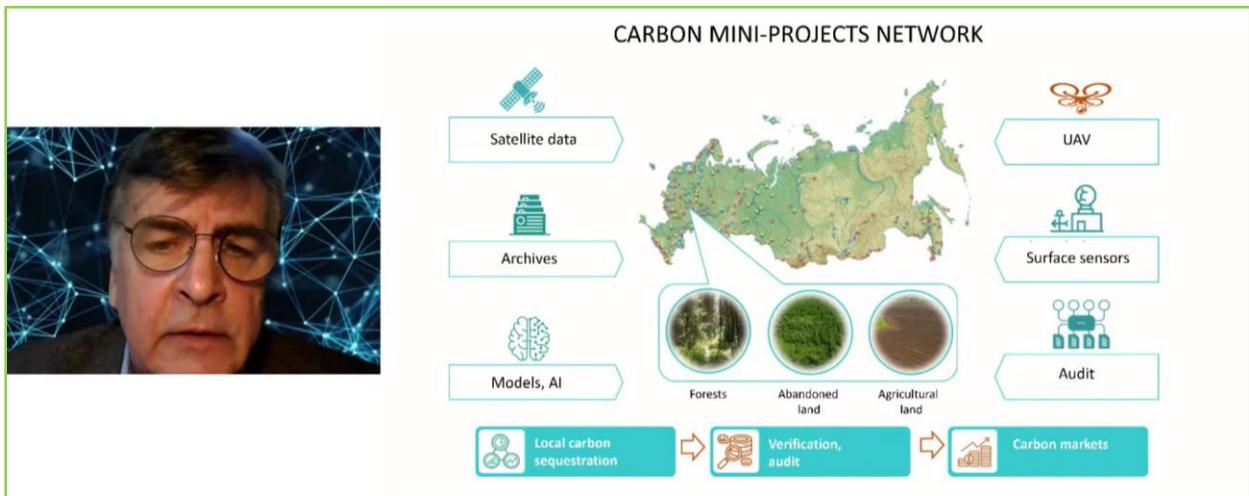


Illustration 12: Nikolai Durmanov presenting on the use of technology to determine soil quality for agricultural use in Russia

Nikolai Durmanov's presentation shone light on the new technologies and innovations set to transform agricultural sectors. He explained the concerns, however, of the industry; whether to

invest now into new technologies and innovations when there is still uncertainty, or to wait until the picture is clearer. Hence, for carbon sequestration projects particularly in Kazakhstan where there are expanse lands available, it is important to start with low risk and small-scale projects. The aridity of Kazakhstani climate means that the lands can be covered with surface grasslands which would not only restore soil but provide opportunities for biofuel production.

Durmanov focused on the topic of regenerative agriculture. The climatic conditions and agricultural projects do not always coincide since high yields have been contradictory to the replenishment and retainment of soil quality. However, as he put, "what gets measures, can be managed. And new technologies of carbon surveillance and management provides just that. However, not every region can implement such satellite technologies. Hence, efforts have been made to develop drone technologies and unmanned aerial vehicle (UAV) systems which can assess the efficiency of climate projects over millions of hectares. Drones attached with multi spectral cameras and other equipment help to visualise a digital surface over which the emissions and sequestration levels can be measured. However, the execution of such technologies requires a critical mass of competent knowledge and skills.

In Russia, small-scale climate projects were developed and monitored from space satellites to consider their effectiveness. This was done to improve the contingencies of such projects. For Kazakhstan, such technologies can be replicated either via satellite or UAV systems, however, it is crucial to invest in the training and education of the skills required for such projects, as well as the need for international cooperation, standardised verification and auditing procedures, and lastly, the construction of exchange mechanisms. Durmanov re-emphasised that to implement such technological advancements, small-scale projects presented the needed low-risk opportunities. He concluded with "*Think globally, act locally, and start small.*"

AbuBakr Muhammad

Associate Professor & Chair, Dept. of Electrical Engineering, Lahore University of Management Sciences (LUMS) (virtual)

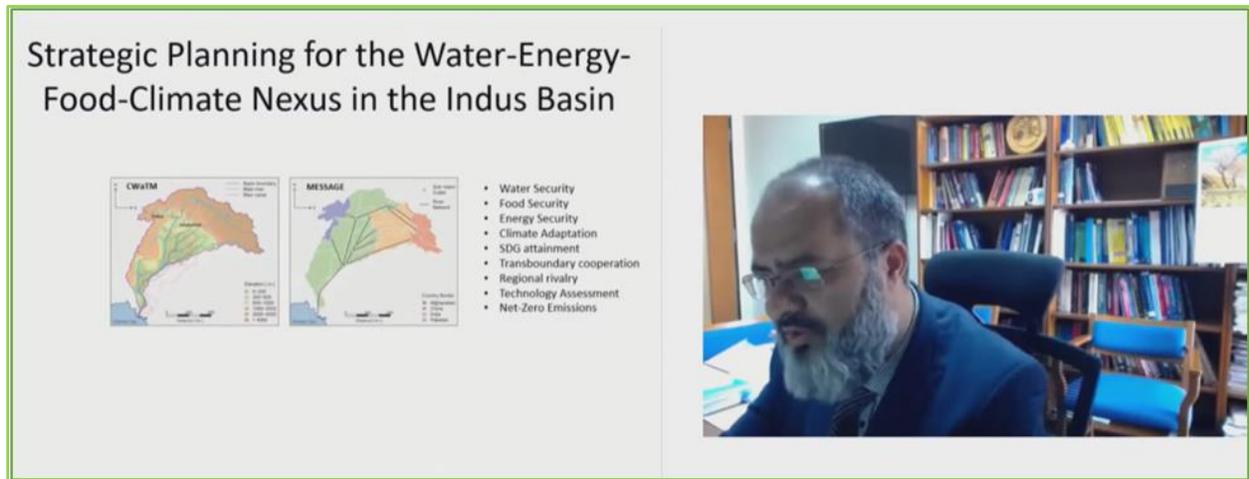


Illustration 13: AbuBakr Muhammad presented on agricultural communities in Pakistan

In his presentation, AbuBakr Muhammad presented case studies of low-tech sustainable farming techniques utilised in Pakistan. He first presented the development challenges in Pakistan; notably, climate change has manifested into high water stress challenges in Pakistan which also has consequences for food security given the country's large agricultural sector. Pakistan's agricultural sector includes small-scale farmers who disproportionately face the plight of climate change. *"The advent of the new digital technologies especially with precision agriculture, robotics, and internet of things, etc. is also making it difficult for small farmers to sustain; thus, we consider sustainability not only from a climate change perspective but also from perspective of water security and the livelihood of small farmers."*

His presentation showcased the means through which researchers are integrating climate resilient technologies in agriculture for Pakistan: with regenerative technologies, permaculture, as well as no till farming, raised beds, intercropping, precision seeding, and other less technology intensive methods. Simultaneously, as digital technologies such as UAV systems and censoring technologies are being rolled out, low-cost methods enable farmers to cope with the variations being impacted by climate change.

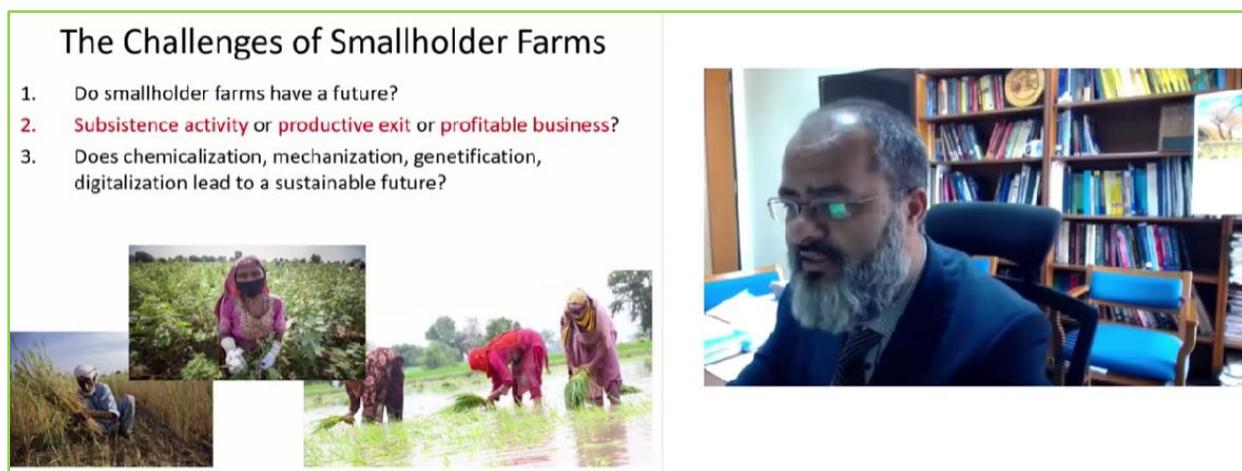


Illustration 14: Abu-Bakr presenting on the agricultural challenges of small-scale farmers in Pakistan

In his example, Muhammad demonstrated the areas in which carbon balancing has been studied locally, with considerations of:

1. Improved diets of animals,
2. Better management of manure for biogas and organic fertilisers,
3. Shifting toward renewable energies including solar energy and biogas,
4. Promoting agroforestry methods through Mango orchards and Moringa plants amongst others,
5. Implementation of Regenerative Agricultural practices.

"In some of the analysis, we found the high-tech solutions are overshadowed by simple solutions including orchards, agroforestry, they basically provide better balancing solutions than the high-tech solutions – an eye opener." His presentation highlighted the importance of organisations such as IIASA which focus on equipping policymakers with strategic planning tools to facilitate a better understanding of how countries with developing countries such as Pakistan finance mitigation measures via sustainable transformation of energy and agricultural sectors.

Concluding his presentation, Muhammad addressed the sense of disparity for low emission countries to embark on sustainable transformations given the contributions of developed countries in exacerbating the problem of climate change which causes catastrophes in vulnerable regions. He pointed out that although such dialogues are difficult to conduct, it is important to realise that sustainable transformations also address water stress, contamination, land

degradation, and pollution issues which are not directly related to global warming. "The unsustainable practices in agriculture exist despite climate change and solutions like carbon farming, clean energy, provide financing opportunities for adaptation or mitigation strategies in addition to taking care of the original problems."

Saule Moldabaeva

Director, Department of Strategic planning and Analysis, Ministry of Agriculture of the Republic of Kazakhstan



Illustration 15: Saule Moldabaeva delivering her presentation

Saule Moldabaeva's presentation focused on the current activities in agriculture toward sustainable transformations. She noted that low carbon development transitions involve high costs which Kazakh farmers cannot afford. Currently, farmers may struggle to maintain their fundamental assets and agricultural equipment while some lack the knowledge to implement such methods. The national Ministry of Agriculture has announced it focus up to 2050 toward increasing the volume of agricultural production by USD \$ 16 billion. This is bound to have an impact on the environment, water availability, land degradation, and climate change.

Moldabaeva, speaking through her extensive experience with the local farming communities, reminded the audience of the sensitivity and apprehension by these communities toward new interventions. Rural communities in Kazakhstan would benefit from governmental support as well as continuous integration into the decision-making processes of sustainable transformations in

agriculture. She also addressed the existing concerns around carbon markets including the level of interest in specific kinds of carbon credits, geopolitical stability, diversion of land from food production, and water stress. Most of the agricultural lands are rented or leased by farmers so the ministry continues to monitor land agreements; it is particularly important in such conditions to ensure wise use of land plots particularly in terms of planting modern cultures of seeds and materials, which would also be useful for carbon farming projects.

Furthermore, the ministry continues to pursue subsidisation of procurement of agricultural technologies, with the aim to integrate hydro services and irrigation technologies into these programs. The Ministry of Agriculture foresees a remission of 50% of expenses for irrigation systems as well as water saving technologies. She concluded her presentation by reemphasising the need to integrate farming communities into discussions of sustainable transformations for agriculture given their reservations of new interventions, lack of financial resources, technical knowledge, and competencies.



Illustration 16: Elena Rovenskaya presenting her remarks on the discussion of Panel 2

Panel 3: Towards a carbon market in Eurasia (Hybrid)

Shuhong Wu

Professor, School of Nature Conservation, Beijing Forestry University (virtual)

Methodologies

- CDM A/R projects
 - Methodology for reforestation of degrade land AM-0001 (AR-ACM0003)
- CCER forestry projects
 - Registered:
 - Methodology for afforestation projects (V01)
 - Methodology for Bamboo afforestation projects
 - Methodology for forest management projects (V01)
 - Methodology for Bamboo management projects
 - Methodology for conservation tillage projects
 - Developing
 - Methodology for wildlife habitat protection projects
 - Methodology for Mine vegetation restoration projects
 - Methodology for urban green space management projects

Illustration 17: Presentation by Shuhong Wu on the various projects in China for CDM and nature conservation

Shuhong Wu presented several case studies of sustainable transformation interventions taken place in China. Since 2006, China has invested into various carbon emissions reduction projects. Since 2013, China has developed approximately 64 projects in CDM; such projects are also being tested in 29 other countries. Besides CDM projects, VCS projects are also being developed; with currently 32 projects operating in China. China is also expected to relaunch its China Certified Emissions Reduction (CCER) scheme – a voluntary carbon credit plan, which would aim to include operations of renewable power and afforestation projects. Wu presented 14 projects which her university was involved in. One direction encompassed the protection of forestry resources and

wildlife. Importantly, China also aims to better monitor green areas and biodiversity of urban areas which could improve carbon sequestration and reduce pollution issues in cities. By 2021, the national ministries also approved and published laws on carbon neutrality achievement and there is increasing focus on this area by governmental authorities.

Gulmira Galieva

Head, Non-Carbon Development Directorate, Climate Policy and Green Technologies Department of the Ministry of Ecology, Geology and Natural Resources of Kazakhstan (virtual)

Участие РК в международном процессе по изменению климата	
1992 год	• Принятие Рамочной Конвенции ООН об изменении климата (РКИК ООН)
1995 год	• Указ о ратификации Республикой Казахстан РКИК ООН
1999 год	• Подписание Киотского протокола к РКИК ООН об изменении климата
2009 год	• Ратификация Киотского протокола к РКИК ООН об изменении климата
2 августа 2016 года	• Подписание Парижского соглашения
4 ноября 2016 года	• Ратификация Парижского соглашения

Illustration 18: Gulmira Galieva delivering her presentation on Kazakhstan's roadmap of climate action

Gulmira Galieva delivered a brief presentation on the state policy of Kazakhstan in terms of carbon intensity and introduction of renewable energy. The country has participated in international processes of climate change since 1992, adopting the Kyoto Protocol and pledges of the Paris Agreement. For the latter, the country pledged to reduce GHG emissions by 15% from the levels of 1990. Furthermore, Kazakhstan has announced its ambition to achieve carbon neutrality by 2060. "As for state regulation one instrument to achieve goals of Paris Agreement is to set up

emissions trading to decrease emissions and main objective is to regulate GHG emissions and to incentivise greener enterprises. "In 2018, the country launched the emissions trading system and was further revised in 2020 and 2021 as per the national environmental ambitions. She concluded her presentation by outlining the ministry's aim to cooperate with European institutions to further improve and amend the trading and exchanges of carbon credits.

Ettore Maria Lombardi

Professor, School of Law, University of Florence

Ettore Maria Lombardi briefly discussed his views on the two fundamental revolutions taking place in law and policy: digitalisation, and the green revolution. He explained that whilst digitalisation is a bottom-up revolution driven by consumer demands, innovations, and businesses; the green revolution is occurring in a top-down cascade whereby regulators are setting new environmental standards and frameworks such as ESG, which impact how businesses operate, which raises the demand for innovations in the area, and later impacts consumers. The key message is from his presentation was that whilst environmental sustainability is important to discuss, it is crucial to evaluate social and economic implications of the green revolution; this in carbon farming includes the implications of sustainable transformations for rural farmers and communities.



Illustration 19: (In-person) Panel 3

Closing remarks

Rakhim Oshakbayev

Director, Centre for Applied Research TALAP



Illustration 20: Rakhim Oshakbayev delivering the concluding remarks of the event

To conclude the event, Rakhim Oshakbayev stressed the importance of putting measurable actions to ambitions. Since Kazakhstan’s launch of emissions trading schemes, there has not been a systematic procedure to track the progress of these ambitions nationally. He cautioned of the risk that climate change and CO2 reduction solutions are discussed within carbon cults due to a lack of dissemination to the general public.

"I really like the approach of our colleagues that this topic should be inclusive – but we should imagine that there are farmers next to us who ask, 'how much will I earn if I invest in one hectare of carbon farming could you please show a business plan' so that we know we are accountable also for these concerns. When we develop them for Kazakhstan or for Eurasia, these scenarios should be provided on a permanent basis to understand what kind of options we have and including the social impact." He concluded the discussions by showing his support for net-zero nature positive policies in Kazakhstan. Specific to Kazakhstan, "here we have undervalued opportunities. Let us position ourselves as a country which brings something positive for the whole world."

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