The second Regional technical support workshop Report:

Improving GHG inventories and assessing policies in the LULUCF sector

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Regional Climate Action Transparency Hub for Central Asia

ICAT Initiative for Climate Action Transparency

Initiative for Climate Action Transparency – ICAT

Improving GHG inventories and assessing policies in the LULUCF sector

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The second Regional technical support workshop Report: Improving GHG inventories and assessing policies in the LULUCF sector

Introduction

This report provides an overview of the regional practical training “Improving capacity to develop GHG inventories and assess policies in the LULUCF sector” held under the Regional Climate Action Transparency Hub for Central Asia (ReCATH). The workshop took place from 2 to 5 February 2026 in Dushanbe, Tajikistan, bringing together technical experts from the five Central Asian countries.

The training builds on the previous capacity-building workshop held in Bishkek in October 2025 and was designed as a practical follow-up to deepen participants’ skills. While the earlier training focused on methodological foundations, this training emphasized hands-on application, particularly in assessing policies and measures (PaMs) and improving their linkage with national GHG inventories.

The training combined sessions on policy impact assessment using the EX-ACT tool with technical discussions on LULUCF inventory methodologies, including land-use monitoring, biomass estimation, and soil carbon assessment. Through practical exercises, country presentations, and peer exchange, participants strengthened their capacity to apply IPCC methodologies and improve consistency in climate reporting under the Enhanced Transparency Framework (ETF).

Background

The Regional Climate Action Transparency Hub for Central Asia (ReCATH) supports five Central Asian countries—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan—in building robust climate transparency systems and transitioning to reporting under the Enhanced Transparency Framework (ETF) of the Paris Agreement.

Established with a team of national and regional experts, the Hub has become a center of expertise and coordination for technical support, capacity building, and peer learning. Since 2022, ReCATH has organized over 27 capacity-building events and supported the development of national GHG inventories, adaptation reporting, NDC tracking, and climate finance.

The second phase of ReCATH, launched in April 2025, aims to deepen the region’s technical capacity in inventory, support the preparation of updated NDCs (NDC 3.0), improve climate reporting, and promote regional cooperation. Key activities include peer reviews of GHG inventories, development of regional monitoring frameworks on adaptation, support for green taxonomy and climate finance, and enhanced collaboration with other international transparency initiatives. Through its activities, ReCATH continues to strengthen institutional frameworks and long-term transparency practices in Central Asia.

Objectives

This regional training, held under Modules 2 and 3 of the ReCATH project, aimed to strengthen national and regional capacities in developing GHG inventories and assessing policies and measures (PaMs) in the LULUCF sector, building on the outcomes of the October 2025 training in Bishkek.

The workshop focused on two main areas: enhancing the capacity to assess the GHG impact of LULUCF policies using the EX-ACT tool, and strengthening technical

understanding of inventory methodologies in line with the 2006 IPCC Guidelines and the 2019 Refinement.

Through practical exercisesand technical sessions, participants improved their ability to quantify emissions and removals apply expert judgement, and improve consistency between policy assessments and national inventory reporting. The training also supported the identification of key data needs and contributed to improving the integration of LULUCF policies and measures into NDC and BTR reporting under the Enhanced Transparency Framework.

Participants

The training was attended by representatives from ministries and hydrometeorological services of Central Asian countries, including Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Participants included national greenhouse gas inventory compilers, natural resource agency representatives, members of the ReCATH Technical Working Group, representatives from GHGMI, Citepa.

The full list of participants is provided in Annex 1.

Meeting minutes

Day 1

The opening session was moderated by Valeriya Orlova, ReCATH Project Specialist, who welcomed participants and introduced the objectives of the training. She emphasized that the workshop builds on the previous capacity building event held in Bishkek and is designed to deepen participants' practical skills in assessing policies and measures in the LULUCF sector. She encouraged active engagement, noting that the training would focus heavily on hands-on exercises and real country data.

Dilovarsho Dustzoda, ReCATH Project Manager welcomed participants and highlighted the importance of strengthening national systems for Measurement, Reporting and Verification (MRV). He noted that greenhouse gas inventories, NDC implementation, and BTRs are interconnected processes that require continuous capacity building. He stressed that improving data collection, inter-agency coordination, and technical expertise is essential for ensuring high-quality reporting under the ETF.

Umarali Abdullozoda, Deputy Director of the Hydrometeorological Agency under the Committee for Environmental Protection under the Government of the Republic of Tajikistan, welcomed participants to Dushanbe and highlighted growing climate challenges in the region. He emphasized the critical role of the LULUCF sector both as a source and sink of greenhouse gases, and highlighted the importance of strengthening inventory systems, improving methodologies, and ensuring transparency in reporting. He noted that the workshop provides an important platform for regional cooperation and knowledge exchange.

Following the opening session, the technical session was led by Anna Sikharulidze, The session began with an overview of reporting requirements under the ETF, including the need to report both expected and achieved emission reductions, as well as the methodologies and assumptions used in calculations.

During the session, Ms. Sikharulidze discussed one of the key methodological challenges: defining what constitutes a "policy or measure" in the LULUCF sector. She

demonstrated different approaches to structuring policies and measures, including grouping them by policy instruments (such as strategies, programs, and projects) or by activity types (such as afforestation, forest management, pasture management, and cropland practices). She emphasized that countries have flexibility in choosing their approach, but must ensure transparency, avoid double counting, and maintain consistency between reported measures and inventory categories. Examples from various countries illustrated how different reporting approaches affect the ability to estimate emission reductions and communicate results clearly.

The session also highlighted the importance of assumptions in policy assessment. Participants were encouraged not to avoid assumptions due to data gaps, but rather to document them transparently and justify them based on available information. The trainer stressed that even countries with advanced MRV systems rely on assumptions, and that transparency is more important than precision when complete data are not available.

Following the morning session, participants delivered country presentations on policies and measures selected for further assessment in the LULUCF sector. The presentations provided an overview of national strategies, ongoing initiatives, and available data, and served as the basis for the subsequent practical exercises.

Kazakhstan presented its updated NDC 3.0 and the Strategy for Carbon Neutrality, emphasizing an increase in ambition compared to previous commitments. The country outlined a target to reduce greenhouse gas emissions by 17% below 1990 levels by 2035 (unconditional), with a potential increase to 25% with international support. In the LULUCF sector, key measures include large-scale afforestation initiatives, including a national program to plant up to 2 billion trees, as well as expansion of forest areas and protective green belts around settlements. Additional measures focus on sustainable agricultural practices, such as no-till farming and crop rotation on approximately one million hectares, aimed at improving soil carbon retention. Kazakhstan also highlighted regulatory measures introduced through the Environmental Code to combat land degradation and promote sustainable land management. The presentation further addressed the development of forest carbon offset mechanisms and the role of private sector participation, while noting existing challenges related to regulatory clarity and implementation of Article 6 mechanisms under the Paris Agreement.

Kyrgyzstan presented a comprehensive overview of its policy framework, which includes national strategies, sectoral programs, and action plans related to forestry, agriculture, and pasture management. The country highlighted its long-term objective to increase forest cover and achieve carbon neutrality targets, as reflected in national development strategies and NDC commitments. Key measures include afforestation and reforestation activities, protection of forest ecosystems from fires and pests, and support for natural forest regeneration. In addition, Kyrgyzstan emphasized the importance of sustainable pasture management, including reseeding, rotational grazing, and restoration of degraded lands. The presentation also covered initiatives aimed at expanding perennial crops, including orchards and vineyards, partly through the conversion of low-productivity pastures. While some mitigation estimates are available for specific measures, the country noted that many activities lack quantified targets or consistent data, which presents challenges for impact assessment and reporting.

Uzbekistan presented a detailed overview of policies and measures in the LULUCF sector, highlighting both mitigation potential and ongoing large-scale national programs. The country reported that the LULUCF sector currently acts as a net sink, with removals

estimated at approximately 8.46 million tons of CO_2 in 2022. Key measures include large-scale afforestation and agroforestry initiatives, particularly in the Aral Sea region, as well as programs aimed at restoring degraded lands and combating desertification. A central policy highlighted was the national project “Yashil Makon” (“Green Nation”), which aims to significantly expand forest cover to 6.1 million hectares by 2030 and includes annual planting targets of up to 200 million seedlings. Additional measures include expansion of urban green spaces, establishment of protective forest belts, and restoration of forests on the dried seabed of the Aral Sea. The country also presented policies promoting sustainable agriculture, including crop rotation, reduced tillage, and a gradual transition to organic farming practices. Institutional improvements, such as strengthening land cadaster systems and MRV frameworks, were also identified as key priorities.

Turkmenistan presented its regulatory and programmatic framework for the LULUCF sector, focusing on legal instruments and national programs aimed at improving land and forest management. The presentation highlighted the Forest Code, the National Forest Program, and the state program “Green Belt,” which promotes afforestation and greening activities to improve ecological stability and reduce erosion. In addition, Turkmenistan outlined measures to restore degraded lands, including phytomelioration and the creation of protective forest strips in desert and semi-desert areas. The Law on Pastures and the National Program to Combat Desertification were also highlighted as key instruments supporting sustainable land use and the restoration of vegetation cover. The presentation emphasized ecosystem resilience, particularly in relation to drought, salinization, and wind erosion, while also noting the importance of integrating these measures into broader climate and land management strategies. Tajikistan’s presentation was scheduled for the following day.

In the afternoon, participants engaged in a practical working session using the EX-ACT tool. A brief overview of the EX-ACT tool and its application for assessing the impact of policies and measures in the LULUCF sector was provided. The trainer guided participants step-by-step through the process of translating policy measures into quantifiable activities, defining baseline and project scenarios, and applying assumptions where necessary using an example policy. Participants followed the demonstration on their own computers, replicating calculations and exploring how different inputs affect results. This hands-on exercise allowed participants to better understand how to estimate emission reductions and removals in practice and highlighted the importance of clear assumptions and structured data.

The subsequent working session focused on identifying data needs required for policy assessment. Participants discussed the types of data necessary for conducting assessment using EX-ACT, including activity data, land areas, management practices, and timelines. Common challenges identified across countries included the lack of quantitative targets in policy documents, incomplete statistical data, and limited coordination between institutions responsible for data collection. Participants emphasized the need to strengthen national data systems and improve data sharing mechanisms, while also recognizing the importance of using justified assumptions in cases where data are unavailable.

The day concluded with a closing discussion reflecting on lessons learned. Participants noted that defining and structuring policies and measures is a critical step that directly affects the feasibility of assessment. They emphasized that while there is no single correct approach, transparency, consistency, and avoidance of double counting are

essential. The discussion also highlighted that data gaps remain a major challenge across the region, but practical tools such as EX-ACT provide a useful framework for conducting assessments even with limited data. Participants agreed that peer exchange and practical exercises significantly enhanced their understanding and provided valuable insights for applying these approaches in their national contexts

Day 2

The second day of the workshop began with a recap of the previous day activities, focusing on key methodological aspects of defining and grouping policies and measures and the initial application of the EX-ACT tool. Anna Sikharulidze welcomed participants and outlined the objectives for the day, emphasizing that the sessions would focus on hands-on application of EX-ACT across different types of mitigation measures in the LULUCF sector from each country.

She explained that participants would continue working through the main categories of measures introduced earlier, including forest management, pasture management, cropland practices, and perennial crops. In addition, she introduced the Excel reporting template to help participants gather structured information on each measure, such as its description, type (policy, program, or project), target indicators, achieved results, and estimated emission reductions for specific years (e.g., 2024 and 2030) as input into the EX-ACT tool

The morning session focused on practical demonstrations of how to assess different types of mitigation measures using EX-ACT. The trainer guided participants through several examples, starting with forest-related measures such as fire prevention and pest control. She explained that these types of measures often lack quantitative targets and therefore require the use of proxy indicators and expert assumptions. Participants explored how to model fire frequency and biomass loss under baseline and project scenarios, observing that emissions may occur in both cases, but are reduced under improved management conditions. The importance of using average or cumulative values for reporting was emphasized, given the variability of such disturbances over time.

The session then addressed illegal logging, where participants applied a similar approach by adjusting harvesting intensity in baseline and intervention scenarios. This exercise demonstrated that even when emissions remain present, improved governance and enforcement measures can significantly reduce their magnitude. Participants also experimented with different implementation dynamics, such as immediate versus gradual changes, and assessed how these assumptions influence results.

The training then moved to pasture management, highlighting challenges related to limited data availability and lack of alignment between policy descriptions and IPCC land-use categories. Participants learned how to model improvements in pasture condition as transitions within the same land-use category, for example from degraded to improved grassland. Measures such as rotational grazing, reseeding, and controlled access were considered, with results showing gradual carbon sequestration over time. The trainer emphasized the importance of expert judgment in defining baseline conditions, particularly when quantitative data are not available.

Further exercises focused on cropland management, where participants assessed the impact of improved agricultural practices, including reduced tillage, increased organic

inputs, and improved residue management. The results illustrated a balance between increased soil carbon sequestration and higher nitrous oxide emissions, highlighting the need to consider multiple greenhouse gases when evaluating mitigation outcomes.

The session also covered perennial crops and land-use change, demonstrating how outcomes depend strongly on the initial condition of the land. Participants modeled scenarios where degraded grasslands are converted into orchards or vineyards, resulting in long-term carbon sequestration despite initial emissions due to land-use change. In contrast, conversion of non-degraded land resulted in increased emissions, reinforcing the importance of selecting appropriate baseline assumptions and carefully evaluating whether a measure leads to net mitigation benefits.

Following the morning technical sessions, participants continued working in groups to apply the EX-ACT tool to their national policies and measures in the LULUCF sector. During this process, several methodological challenges were identified, including the absence of quantitative indicators in policy documents, incomplete statistics on activities such as illegal logging, and difficulties in aligning national classifications with EX-ACT categories. In some cases, participants chose not to assess certain measures due to insufficient data, while in others they applied simplified assumptions or used proxy indicators to approximate impacts.

In the afternoon, the workshop included the country presentation from Tajikistan, which had not been delivered on Day 1. The presentation provided a comprehensive overview of policies and measures in the LULUCF sector, as well as recent trends in emissions and removals. It was noted that the sector has transitioned towards net removals in recent years, reflecting the increasing role of forests and land management in national climate policy.

The presentation highlighted several key policy frameworks, including the Green Economy Development Strategy (2023–2037), which includes measures on afforestation and prevention of land degradation, with a target to increase forest area by 10% by 2028. Additional measures are implemented through the Forest Sector Development Program (2022–2026), which includes over 60 activities aimed at forest restoration, increasing productivity, and strengthening ecosystem services. Quantitative targets include restoration of more than 15,000 hectares of forest, establishment of industrial forest plantations, and expansion of nursery production capacity to millions of seedlings.

Further measures include the Pasture Development Program (2023–2027), which focuses on improving pasture productivity, restoring degraded areas, and strengthening institutional frameworks for pasture management. The State Environmental Program (2023–2028) and the national greening program up to 2040 were also presented, both of which include measures aimed at expanding forest cover, improving land conditions, and enhancing monitoring and enforcement systems. The presentation emphasized that many of these programs include qualitative objectives and broad targets, which may require further refinement for quantitative assessment.

Following the presentation, participants continued their group work and prepared brief presentations with preliminary assessment results to share with workshop participants. Country groups shared initial findings and discussed key challenges. For example, Turkmenistan presented results related to agricultural expansion and pasture restoration, noting technical issues such as inconsistencies in activity data. Uzbekistan presented several measures, including afforestation of the Aral Sea region and fire prevention

activities, while highlighting the need to avoid double counting of emissions across sectors. Kyrgyzstan presented preliminary results from afforestation and pasture management measures, demonstrating gradual increases in carbon sequestration over time.

The session concluded with a brief closing discussion, during which participants reflected on key lessons learned throughout the day, including the importance of methodological consistency, careful selection of parameters, and the need to align policy assessments with inventory approaches. Participants highlighted remaining challenges related to data availability and the application of the EX-ACT tool in national contexts.

At the end of the day, participants were invited to complete a short feedback survey to evaluate the training. The survey aimed to gather participants' impressions on the content, structure, and usefulness of the sessions, as well as to identify priority areas for further capacity building and technical support. The feedback collected will be used by the organizers to improve future trainings and better respond to the needs of participating countries.

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Day 3

The third day of the workshop was led by Etienne Mathias, who opened the session by outlining the objectives for the two-day technical block dedicated to GHG inventory development in the LULUCF sector. He emphasized that the format of the session would be highly interactive, encouraging participants to actively contribute by sharing both achievements and challenges encountered in their national inventory systems.

At the outset, Mr. Mathias linked the previous sessions on policies and measures and the use of the EX-ACT tool to the current focus on national inventories. He highlighted a key methodological challenge: while tools such as EX-ACT are widely used to assess mitigation measures and support NDC development, they are not directly aligned with the methodologies used for national GHG inventories under the UNFCCC. This creates a disconnect between projected mitigation impacts and reported inventory results. In practice, countries often use different tools, datasets, and assumptions for historical inventories and forward-looking scenarios, which may lead to situations where the effects of implemented policies are not reflected in official inventory data.

He further explained the reporting requirements under the Paris Agreement, noting that countries must submit both Common Reporting Tables (CRT) for inventories and Common Tabular Formats (CTF) for tracking progress toward NDCs. CTF tables require reporting on expected and achieved reductions of emissions from policies and measures typically based on modeling, inventories are based on observed data. This difference reinforces the need to improve alignment between policy assessment tools and inventory methodologies, particularly in the LULUCF sector, where changes are often driven by land-use change dynamics rather than land management changes arising from policy interventions.

The expert also highlighted several structural complexities specific to the LULUCF sector. Unlike other sectors, emissions and removals are strongly influenced by land-use change processes that may not be directly linked to policy decisions. At the same time, many policies focus on land management rather than land-use change, making it difficult to attribute observed inventory trends to specific interventions. He stressed that the sector is highly sensitive, as even small methodological differences can lead to large variations

in reported emissions or removals.

Following this introduction, participants shared their national experiences in compiling LULUCF inventories providing an overview of their methodological approach, highlighting successes and challenges.

Kazakhstan presented a relatively advanced system based on the application of IPCC 2006 Guidelines and elements of the 2019 Refinement, using a Tier 2 approach. The inventory covers a long time series from 1980 to 2024, with interpolation applied where data are missing. The presentation highlighted the use of multiple carbon pools across land-use categories, including above- and below-ground biomass, dead organic matter, and soil carbon. However, a major challenge remains the lack of reliable data on land-use conversions. As a result, land-use change matrices were constructed based on assumptions, such as the conversion of pastures into forest land. Additional challenges include inconsistencies in data sources, limited soil monitoring data prior to 2007, and discrepancies between cadastral and statistical datasets. During the discussion, participants explored the potential of remote sensing to improve land-use monitoring, noting that while satellite data can enhance spatial analysis, they still require ground-based validation and integration with existing data systems.

Kyrgyzstan illustrated a contrasting situation, characterized by the absence of a dedicated institutional framework for inventory compilation. The country applies a Tier 1 approach using IPCC 2006 Guidelines, with time series starting from 1993. The methodology relies on aggregated land-use data without detailed tracking of transitions between categories (Approach 1). Several land categories such as wetlands and settlements are not assessed. The presentation highlighted the use of default emission factors and the reliance on national definitions of forest land. A recent national forest inventory revealed an increase in forest area, primarily due to improved accounting rather than actual expansion raising the issue of time series consistency. Key challenges include limited data availability, lack of continuous monitoring, absence of national emission factors, and institutional fragmentation. Despite these limitations, the country continues to improve its system through inter-agency collaboration.

The discussion following these presentations provided deeper insights into region-specific challenges. One important example concerned pasture dynamics, where reduced grazing pressure has led to the expansion of shrub vegetation. While this trend negatively affects agricultural productivity, it contributes positively to carbon sequestration, illustrating the complex trade-offs between land management objectives and climate mitigation. Participants also discussed the lack of default IPCC emission factors for such specific conditions, highlighting the need to develop national coefficients.

The session then moved to the presentation from Tajikistan, which provided an overview of national emission trends and methodological approaches. The country reported that total emissions excluding LULUCF have decreased significantly since 1990, while the LULUCF sector functions as a net carbon sink. Forest lands contribute most to removals, while other land categories show high interannual variability due to land-use changes. The methodology is based on IPCC default values (Tier 1), with the gain-loss method applied for forests and stock-difference methods for land conversions. However, many estimates rely on assumptions due to limited data availability. Participants raised questions regarding high emissions reported for “other land” categories and the treatment of perennial crops, which were assumed to be in equilibrium and therefore not contributing to net removals.

Turkmenistan presented its inventory system, also based on IPCC 2006 Tier 1 methodology, covering the period 2000–2021. The presentation highlighted the importance of the LULUCF sector in a country dominated by pasture and desert landscapes. However, the lack of land-use change matrices and limited data availability constrain the accuracy of estimates. Key gaps include missing data on fires, absence of national emission factors, and incomplete assessment of non-CO_2 gases. It was noted that even in the absence of detailed data, applying default IPCC methods for gases such as N_2O remains important to meet reporting requirements.

Uzbekistan presented its experience in assessing carbon removals, noting that the LULUCF sector contributes approximately 4% of national mitigation potential, with around 8 million tonnes of CO_2 removals. The country applies a Tier 1 methodology and focuses on three main land categories. Large-scale afforestation initiatives, including planting one billion trees and restoring the Aral Sea region, were highlighted as key mitigation measures. However, significant methodological challenges remain, particularly in translating planting targets into measurable inventory outcomes. The absence of land-use change matrices and limited biomass data complicate the assessment of these initiatives. Discussions emphasized that planting trees does not automatically translate into immediate carbon gains in inventories, as accounting must reflect actual growth over time rather than planned activities.

A broader discussion followed on land classification and data integration challenges across the region. Participants noted that land-use categories such as forest land, pasture, and settlements often overlap in practice, and that tree planting activities frequently occur outside officially designated forest areas. This creates difficulties in capturing such activities within national inventory systems, particularly when land tenure and institutional responsibilities are fragmented. The discussion highlighted the importance of distinguishing between inventory reporting requirements and project-based or policy-driven activities, as these operate under different frameworks and levels of precision.

The session then transitioned to a technical module on land-use monitoring and IPCC approaches. Mr. Mathias introduced the three land representation approaches defined by the IPCC: Approach 1 (total land area without tracking transitions), Approach 2 (land-use change matrices), and Approach 3 (spatially explicit data). He explained that while many countries in the region currently rely on Approach 1, moving towards Approach 2 is essential for improving inventory accuracy and transparency.

The discussion on land-use change matrices provided practical insights into how countries can transition from aggregated data to more detailed representations of land-use dynamics. Participants examined examples where matrices were constructed using assumptions and interpolation, particularly in data-scarce contexts. The expert emphasized that while such matrices may not fully reflect reality, they represent a necessary step toward more advanced methodologies. He also highlighted common technical challenges, such as circular references in spreadsheets, and provided guidance on simplifying matrix structures by limiting the number of possible land transitions.

The final part of the session focused on the use of international datasets derived from remote sensing.[1] Participants explored how these datasets can be used to derive land-

[1] https://projectgeffao.users.earthengine.app/view/reu-ldn-assessment

use maps, track changes over time, and generate transition matrices. While such data provide valuable insights, the expert cautioned that they may not fully align with national definitions and should therefore be used as complementary sources rather than replacements for national data.

The day concluded with a summary of key messages. Participants acknowledged that the link between policies and inventories remains a major challenge, particularly in ensuring that mitigation measures are reflected in national reporting. Land-use monitoring and the development of land-use change matrices were identified as critical areas for improvement. While international datasets offer useful support, building robust national systems remains essential. The importance of long-term investment in data systems, institutional coordination, and capacity building was emphasized as a prerequisite for improving inventory quality in the LULUCF sector.

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Day 4

The fourth and final day of the workshop was led by Etienne Mathias (CITEPA) and focused on deepening technical understanding of key methodological aspects of greenhouse gas inventories in the LULUCF sector, building on the discussions from the previous day. The session was designed to consolidate participants' knowledge of land-use monitoring approaches and to introduce more advanced topics related to biomass estimation, perennial crops, grassland management, and emerging areas such as trees in settlements.

The day began with a continuation of the discussion on land-use monitoring and the construction of land-use change matrices. Mr. Mathias revisited the use of international datasets derived from remote sensing, demonstrating how countries can extract land-use change matrices from global platforms and convert them into formats compatible with national inventory requirements. Using a practical Excel-based template, he showed how raw data on land conversions over a given period (e.g., 1992–2018) can be transformed into annual transition matrices by calculating average yearly changes and applying them to a selected reference year.

This approach allows countries to reconstruct consistent time series of land-use changes even when only partial data are available. The expert emphasized that while such methods do not guarantee accuracy, they provide a practical and efficient way to ensure internal consistency and avoid major calculation errors. He also highlighted the flexibility of the approach, noting that different data sources (e.g., deforestation data from one source and wetland changes from another) can be combined within a single consistent framework.

A significant part of the discussion focused on the role of climate zones and soil types in inventory calculations. It was clarified that land-use categories and climate zones represent different dimensions of analysis and must be treated independently. However, incorporating both dimensions significantly increases the complexity of calculations, as it requires splitting land areas into multiple combinations of land-use types, climate zones, and soil classes. Participants discussed practical approaches to managing this complexity, including the use of aggregated assumptions for smaller countries and more detailed stratification for larger or more heterogeneous territories.

The session also addressed the challenges of extrapolation and retropolation in inventory time series. Since national reporting under the Paris Agreement requires data starting

from 1990, countries often need to extend available datasets backward or forward in time. The expert demonstrated how constant rates of land-use change can be used for short-term extrapolation but cautioned against applying this approach over long periods, as it may lead to unrealistic results such as negative land areas. For more complex cases, he introduced the use of optimization techniques (e.g., Excel Solver) to reconstruct historical land-use transitions in a way that maintains consistency with known total areas.

Following this, the session transitioned to biomass estimation, with a detailed explanation of Biomass Conversion and Expansion Factors (BCEF). These factors are used to convert available forest data, such as wood volume, into estimates of biomass and carbon stocks. Mr. Mathias explained that BCEF values differ depending on whether they are applied to total stock, annual increment, or removals, and that misunderstanding these distinctions can lead to significant calculation errors. He also highlighted the importance of understanding whether input data include bark or not, as this can introduce discrepancies of up to 15%.

Participants shared their national practices, noting that some countries rely on IPCC default values while others have developed country-specific coefficients. The discussion emphasized that while national factors are preferable when available, they must be applied consistently and transparently. A key takeaway from this session was that BCEF values are interdependent and should not be used interchangeably, particularly in cases where biomass stocks are low.

The next technical block focused on perennial crops, which proved to be one of the more complex topics discussed during the workshop. The expert explained that perennial crops, such as orchards and vineyards, can be assessed using either the gain-loss method or the stock-difference method, depending on data availability. He highlighted significant differences between the 2006 IPCC Guidelines and the 2019 Refinement, noting that default carbon stock values for perennial crops have been substantially revised downward. This has important implications for national inventories, as continued use of outdated values may lead to overestimation of carbon sequestration.

Through a practical example, participants explored how different methodological choices can lead to different results. Three approaches were compared: annual stock change, stock change over a 20-year period, and gain-loss calculations. While all approaches are methodologically valid, they produce different outputs, underscoring the importance of methodological consistency and transparency. The expert also stressed the importance of accounting for both gains and losses, noting that some inventories incorrectly consider only biomass accumulation while neglecting removals due to harvesting or land-use change.

The session then moved to grassland management, with a particular focus on mineral soils. This was identified as one of the most uncertain areas of the LULUCF sector. The expert explained that in grassland systems, the majority of carbon is stored in soils rather than above-ground biomass, making accurate estimation more challenging. He presented comparative data from different countries, showing that many countries either do not report emissions and removals from grassland remaining grassland or assume equilibrium conditions due to lack of reliable data.

Participants discussed the applicability of IPCC default factors for grassland management, noting that these are often based on productive grassland systems and may not be suitable for steppe ecosystems typical of Central Asia. The classification of

grassland into categories such as degraded, improved, or intensively managed was identified as particularly difficult, as available decision tools provide limited guidance. As a result, the expert recommended the development of national studies and context-specific emission factors to improve accuracy.

Country interventions provided valuable practical insights. Kazakhstan highlighted ongoing policy efforts to improve pasture management through rotational grazing, reseeding, and infrastructure development, noting that these measures are expected to enhance carbon sequestration over time. Kyrgyzstan shared experiences from pilot projects on sustainable pasture management, emphasizing that short-term studies are insufficient to capture long-term carbon dynamics. Participants also discussed observed impacts of climate change, including shifts in vegetation zones and increasing biodiversity at higher altitudes, which further complicate the attribution of changes in carbon stocks.

The final technical topic addressed trees in settlements, an area that remains methodologically underdeveloped in current IPCC guidelines. The expert explained that while Tier 1 approaches often assume zero net change, more advanced methods require detailed data on tree numbers, growth rates, and removals. He emphasized that accounting must consider the full lifecycle of trees, including both growth and losses, and that assumptions about growth periods must be justified.

Participants discussed national perspectives on this issue. It was noted that while urban greening initiatives are expanding in some countries, their contribution to national carbon balances is relatively small compared to other sectors. Kyrgyzstan shared that a pilot project on urban forests demonstrated limited mitigation potential relative to the effort required, leading to a decision to prioritize other areas such as pasture and forest management. Kazakhstan similarly noted that accounting for urban trees is not currently a priority, although the topic has been discussed at the policy level.

The session concluded with a synthesis of key messages from the day. Participants recognized that land-use monitoring remains the foundation of LULUCF inventories and that ensuring consistency across time series is essential. While international datasets and simplified approaches can support inventory development, they must be applied carefully and complemented with national data wherever possible. The importance of balancing methodological complexity with data availability was emphasized, as overly detailed approaches may not be practical in data-constrained environments.

The workshop concluded with closing remarks from the organizers, who thanked participants, trainers, and partners for their active engagement throughout the four days. It was noted that the training had been intensive but highly valuable, providing participants with both conceptual understanding and practical tools to improve national inventories. Participants were encouraged to continue collaboration, share feedback, and communicate their needs to support further capacity-building activities in the region.

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Annex II. Concept and agenda of the event

REGIONAL CLIMATE ACTION TRANSPARENCY HUB FOR CENTRAL ASIA (RECATH)

Regional technical support workshop: Improving GHG inventories and assessing policies in the LULUCF sector

February 2 – 5, 2026 | Dushanbe, Tajikistan, Hilton Dushanbe

Background

The Regional Climate Action Transparency Hub (ReCATH) in Central Asia is a project supported by the Initiative for Climate Action Transparency (ICAT). The project aims to enhance countries' capacities in building and managing robust, transparent frameworks that allow them to effectively meet their obligations under the Paris Agreement and facilitate the transition of countries to the new reporting under the Enhanced Transparency Framework (ETF). The ReCATH is hosted by the Central Asia Regional Environmental Centre (CAREC) with a technical implementing partner, the Greenhouse Gas Management Institute (GHGMI).

Addressing climate change involves implementing mitigation and adaptation activities. Thus, countries need to integrate climate change considerations into all national planning instruments; strengthen institutional and technical capacity; implement activities in relevant sectors, address data gaps and improve estimation methodologies; and collect accurate and relevant information to establish and regularly update greenhouse gas emission inventories.

The ReCATH is a collaboration between the five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) and supports technical experts and expert institutions in the region to establish sustainable and integrated Measurement, Reporting, Verification (MRV)/transparency systems.

Continuing the work started in Phase I of this project, the project aims to further strengthen the MRV system in the region by focusing on the following modules of support: (1) improving the quality of GHG inventories and enhancing mutual learning through strengthening peer review quality assurance mechanisms (2) enhancing technical capacity in the LULUCF sector, (3) conducting policy GHG impact assessments, (4) strengthening regional monitoring and evaluation frameworks for reporting on climate adaptation, and (5) enhancing knowledge among decision-makers on green taxonomy to facilitate access to climate finance.

Aims and objectives of practical regional training

This technical support workshop builds on capacity building activities of modules 2 and 3, focusing policy impact assessment work in the LULUCF sector.

The primary objective is to provide technical support to members of the ReCATH

The second Regional technical support workshop Report: Improving GHG inventories and assessing policies in the LULUCF sector

Technical Working Group (TWG) and other members of the national inventory compilation teams as well as sectoral experts in assess GHG emissions and removals associated with the LULUCF sector, and related mitigation activities. The workshop will enable participants to identify and address inventory compilation challenges and assess impact of mitigation policies. As a result, countries' will be able to enhance their GHG inventories and inform development and/or implementation of their NDCs.

The workshop will provide technical support in:

- Country specific LULUCF inventory methods and approaches
- Assessment of LULUCF PaMs impacts on GHG emissions

This workshop follows a capacity building training on inventory methodology and policy assessment fundamentals that took place in October 2025 in Bishkek, Kyrgyzstan. It is strongly encouraged that participants who attended the capacity building workshop in October are able to participate in this workshop.

Structure and format of the event

The practical regional training is intended for **experts** from Central Asian countries who are involved **in the preparation of GHG inventories, manage natural resources such as forests or agricultural lands,** and **land management policy development**.

The event is held **in-person** to facilitate discussion, exchange of ideals, and implementation of hands-on learning activities and exercises that are conducted during the training. Each participant must have his/her own personal computer and internet access will be provided by the organizers of the event. The language is **Russian (interpretation will be available)**.

A training approach and next steps

Prior to the workshop, all nominated expert participants are expected to prepare for the workshop by identifying technical questions and relevant data and gathering relevant information on policies for assessment.

After the in-person workshop, participants will have 2 months to complete any technical follow-up tasks that result from the workshop while receiving consultations from the trainers.

Agenda

Regional practical training: Improving capacity to develop GHG inventories and assess policies in the LULUCF sector

The second Regional technical support workshop Report: Improving GHG inventories and assessing policies in the LULUCF sector

February 2 – 5, 2026 | Dushanbe, Tajikistan, Hilton Dushanbe

	February 2, 2026 | Monday
Opening session	*Moderator: Valeriya Orlova, ReCATH Project Specialist*
10:00 – 10:15	Technical instructions on the format of the meeting Introduction of participants Introduction to the agenda of the seminar
10:15 – 10:30	**Welcome remarks:** • Umarali Abdullozoda , Deputy Director of the Hydrometeorological Agency under the Committee for Environmental Protection under the Government of the Republic of Tajikistan (5 min) • Dilovarsho Dustzoda, ReCATH Project Manager, Climate Change and Sustainable Energy Programme (CCSE), CAREC (5min)
Technical session	*Trainer: Anna Sikharulidze*
10:30 – 11:30	**Overview: Review of EX-ACT tool**
11:30 – 11:45	Coffee break
11:45 – 13:00	**Country presentation: Policies selected for assessment and discussion**
13:00 – 14:00	Lunch
14:00 – 15:30	**Working session: Assessment exercises using EX-ACT tool**
15:30 – 15:45	Coffee break
15:45 – 17:15	**Working session: Identification of data needs for**
17:15 – 17:30	**Closing discussion: Lessons learned during the day**
	February 3, 2026 | Tuesday
Technical session	*Trainer: Anna Sikharulidze*
10:00 –	**Recap of Day 2**

10:15	
10:15 – 11:15	**Working session: Impact assessment of country policies**
11:15 – 11:30	Coffee break
11:30 – 13:00	**Working session: Impact assessment of country policies**
13:00 – 14:00	Lunch
14:00 – 15:30	**Country presentation: preliminary policy assessment results**
15:30 – 15:45	Coffee break
15:45 – 17:15	**Country presentation: preliminary policy assessment results**
17:15 – 17:30	**Closing discussion:** Lessons learned during the session + ICAT survey
	February 4, 2026 | Wednesday
Technical session	*Trainer: Etienne Mathias*
10:00 – 10:15	**Introduction and transition from PAMs to inventories**
10:15 – 11:15	**Country presentation: LULUCF GHG Inventory technical questions (successes)**
11:15 – 11:30	Coffee break
11:30 – 13:00	**Discussion and peer-to-peer exchange**
13:00 – 14:00	Lunch
14:00 – 15:30	**Country presentation: LULUCF GHG Inventory technical questions (challenges)**
15:30 – 15:45	Coffee break
15:45 – 17:15	**Discussion and peer-to-peer exchange**

17:15 – 17:30	**Closing discussion**: Lessons learned during the day
	February 5, 2026 | Thursday
Technical session	*Trainer: Etienne Mathias*
10:00 – 10:05	**Recap of Day 1**
10:05 – 11:15	**Working session: Inventory technical questions - Land use monitoring**
11:15 – 11:30	Coffee break
11:30 – 13:00	**Working session: Inventory technical questions - Mineral soils under grasslands**
13:00 – 14:00	Lunch
14:00 – 15:30	**Working session: Inventory technical questions - Biomass conversion and expansion factors in forestlands**
15:30 – 15:45	Coffee break
15:45 – 16:45	**Working session: Inventory technical questions - Trees in settlements, Biomass growth and harvest from perennial crops**
Closing session	*Moderators: Valeriya Orlova, ReCATH Project Specialist*
16:45 – 17:30	**Plenary session**: Discussion and workshop reflections **Closing remarks**: CAREC Oleg Bulanyi, Senior Program Manager, Initiative for Climate Action Transparency (ICAT) (5 min) **ICAT Survey**