

Gaps and Needs Analysis

Short Version

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Initiative for Climate Action Transparency – ICAT

Gaps and Needs Analysis

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Comprehensive (full and detailed) report on [Gaps and Needs Analysis \(GNA\)](#) was prepared in English by GHGMI with all annexes and activity lists for each climate transparency category.

The **Stakeholder Mapping Analysis Report** was prepared by ReCATH/CAREC and contains matrixes and lists the agencies and institutions, which address the climate change issues and transparency actions in their mandates. There are both [Russian version](#) and [English version](#) of the Report available.

The present short version of the GNA summarizes key findings of the gaps and needs analysis on climate action transparency in Central Asia and is designed for circulation purposes among the specialists and experts in the countries of Central Asia and beyond. The ReCATH and GHGMI strongly recommend referring to the full and detailed reports should any questions or issues with clarity appear.

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Abbreviations

AFOLU	Agriculture, Forestry & Land Use
BAT	Best available techniques
BAU	Business as usual
BR	Biennial Report
BTR	Biennial Transparency Report
BUR	Biennial Update Report
CAREC	The Regional Environmental Centre for Central Asia
CESCD	Committee for Emergency Situations and Civil Defense of Tajikistan
CCCC	Climate Change Coordination Committee of Kyrgyzstan
CEP	Committee for Environmental Protection under the Government of the Republic of Tajikistan
COP	Conference of Parties
CRF	Common Reporting Format
CRT	Common Reporting Tables
DCC	Department on Climate Change of the Ministry of Energy of the Republic of Kazakhstan
ETF	Enhanced Transparency Framework
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GEF	Global Environment Facility
GECCCC	Green Economy and Climate Change Coordinating Committee of Kyrgyzstan
GHG	Greenhouse Gas
GNA	Gaps and Needs Analysis
GoKR	Government of the Kyrgyz Republic
GoT	Government of Turkmenistan
ICEP	Inter-Sectoral Commission on Environmental Protection of Turkmenistan
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use sector
LULUCF	Land Use, Land-Use Change and Forestry sector
MAEP	Ministry of Agriculture and Environmental Protection of Turkmenistan
ME RK	Ministry of Energy of the Republic of Kazakhstan
M&E	Monitoring and Evaluation
MEP	Ministry of Environmental Protection of Kazakhstan
MOAWR	Ministry of Agriculture and Water Resources of Turkmenistan
MPGs	Modalities, Procedures and Guidelines
MRV	Monitoring, Reporting, and Verification
NAP	National Adaptation Plan
NASIC	National Strategy for Adaptation to Climate Change in the Republic of Tajikistan for the period up to 2030
NC	National Communication
NCH	National Committee for Hydrometeorology of Turkmenistan
NDA	National Designated Authorities
NDC	Nationally Determined Contribution referred to in Article 4 of the Paris Agreement
NDP 2026	National Development Program until 2026 of Kyrgyzstan
NDS	National Development Strategy

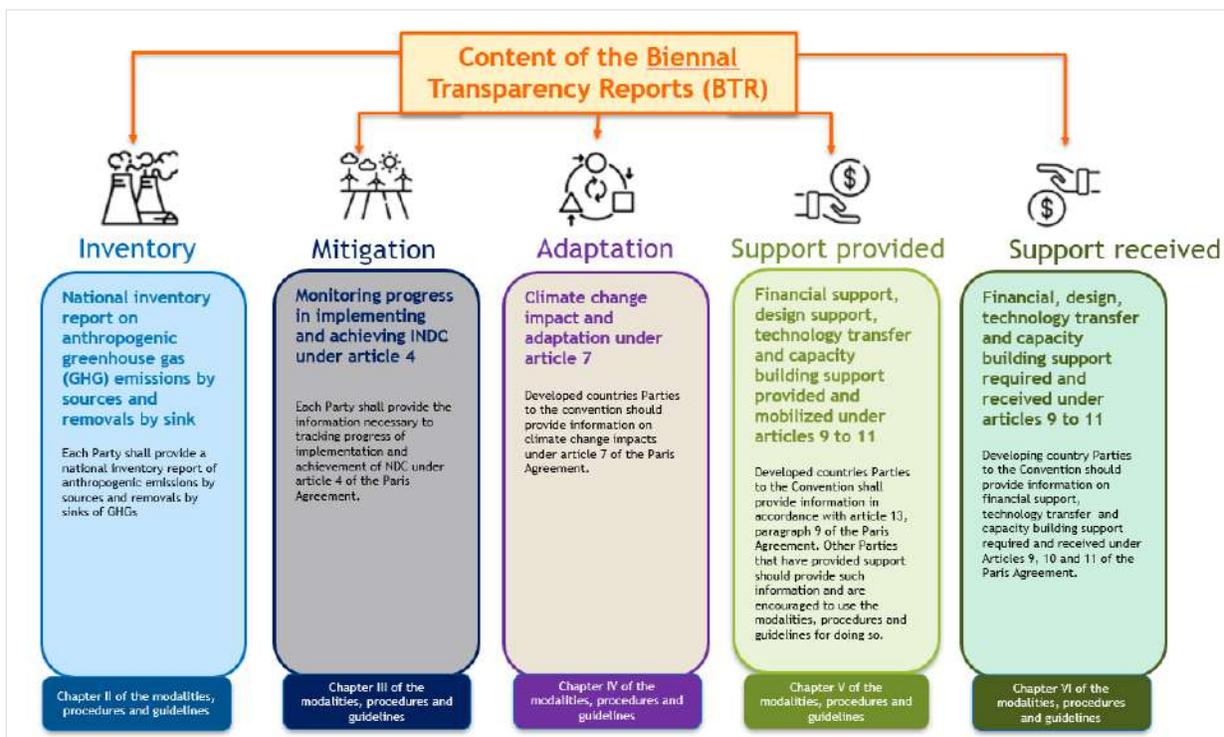
NEX	Nasa earth Exchange database
NIR	National Inventory Report
NSCCA	National Strategy on Climate Change Adaptation of the Republic of Tajikistan until 2030
NSCC	National Strategy on Climate Change Strategy of Turkmenistan
PPCR	Secretariat of the Pilot Program Climate Change Resilience of Tajikistan
RES	Renewable Energy Sources
RK	Republic of Kazakhstan
RoK MEGNR	Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan
SAEPF	State Agency on Environmental Protection and Forestry of Kyrgyzstan
SDGs	Sustainable Development Goals
SCEPLR	State Committee for Environmental Protection and Land Resources of Turkmenistan
SCWM	State Committee for Water Management of Turkmenistan
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

At COP 24, the United Nations Framework Convention on Climate Change (UNFCCC) adopted the rules and procedures for implementing the Paris Agreement, which is contained in the “Paris Rulebook”. Through Article 13, the Paris Agreement established an Enhanced Transparency Framework (ETF) to regularly measure the progress made by countries to strengthen the global response to the threat of climate change. The objective of the new framework is to build mutual trust between countries, raise climate ambition and rigorously monitor public mitigation and adaptation policies.

By 2025, Biennial Transparency Reports (BTRs) have to be submitted by all countries (Fig 1.). For most developing countries this presents a significant challenge due to increased reporting frequency, stronger transparency requirements, increased scope of categories and gases to be reported on a mandatory basis, and a substantial increase of data and information associated with different components of Monitoring, Reporting, and Verification (MRV) that need to be collected and processed.

This project is focusing on establishing a cooperative regional Climate MRV Hub in Central Asia to maximize the effects of collaborative efforts of the international and regional experts and officials toward improving their MRV systems. The project is based on cooperation between the Regional Environmental Centre for Central Asia (CAREC), the consortium of international expert consultants led by the Greenhouse Gas Management Institute (GHGMI), and funded through the Initiative for Climate Action



Transparency (ICAT).

Figure 1. Content of the biennial transparency report¹

To ensure the relevance of the project activities to the regional needs, a preliminary **Gaps and Needs analysis** (GNA) had been completed by the project team of international partners of the GHGMI

¹ Based on decision 18/CMA.1 UNFCCC, annex, paragraph 10.

consortium (CITEPA, Oeko Institute, and EnEco) and regional Fellows in close collaboration with the regional experts in Central Asia and the regional project implementer, CAREC. This report is based on the results of the GNA covering all components of the climate MRV: GHG inventories, emission projections, climate mitigation policies and measures, climate change adaptation, and climate finance. GNA is also the essential part of the project Phase 1 - Transparency needs & gap analysis and planning.

2 Regional Context

Central Asia is a region in Asia that stretches from the Caspian Sea in the west to China and Mongolia in the east, and from Afghanistan and Iran in the south to Russia in the north, including the former Soviet republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan (Figure 2). It is a diverse region with a mix of upper middle- and low-income countries with major strategic importance due to their geographic location and natural resource endowments.



Figure 2. Map of Central Asian countries involved in the Regional Hub

According to the recent (2020) World Bank Report², “over the past decade, the five countries of Central Asia — Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan — have made good progress on integrating climate change considerations into sectoral planning, and in developing solutions from the household to the sector level. All the countries submitted their NDCs to the global climate action under the Paris Agreement and are revising their climate targets for 2020-2021.”

Kazakhstan is an observer of UNFCCC Annex I and as such, it submits a GHG inventory annually as well as National Communications (NCs) and Biennial Reports (BRs). The remaining Central Asia countries are UNFCCC Non-Annex I Parties and submit Biennial Update Reports (BURs) and NCs.

All Central Asian countries have signed and ratified the Paris Agreement and are finalizing the preparation of enhanced NDCs. Table 1 below shows the status of UNFCCC reporting in the region.

Climate change in Central Asia is likely to continue disrupting precipitation, increasing temperatures, and altering the mountain glaciers and snow reserves. The Intergovernmental Panel on Climate Change (IPCC)

² Climate change in Central Asia Illustrated summary. The World Bank, Regional Environmental Centre for Central Asia, 2020; retrieved at: <https://zoinet.org/wp-content/uploads/2018/01/Regional-synthesis-Central-Asia-en.pdf>

assessment of regional impacts of climate change³ suggests that notable changes in grasslands, rangelands, and woodlands should be anticipated. Water shortage, already a problem in Central Asia, may be exacerbated by climate change. This presents an ongoing concern among the countries in the region and indicates agriculture and food security, water resources, human settlements, energy (as hydroelectricity is potentially a significant energy source for the region), and natural disaster sectors as priority sectors in adaptation MRV, which is likely to affect the regional needs in building capacity for the adaptation MRV sector within the project.

Table 1. Status of latest UNFCCC and Paris Agreement submissions by Central Asian countries

Country	National Communication	Biennial Report or Update Report	NDC	LEDS (to 2050)
Kazakhstan (Annex 1)	NC7 (2017)	BR4 (2019)	INDC (2016) Draft NDC under review	Yes ¹
Kyrgyzstan (non-Annex 1)	NC3 (2017)	No	INDC (2020); NDC (2021)	Yes ²
Tajikistan (non-Annex 1)	NC3 (2014)	BUR1 (2019)	INDC (2017); NDC (2021)	No
Turkmenistan (non-Annex 1)	NC3 (2015)	No	INDC (2016)	No
Uzbekistan (non-Annex 1)	NC3 (2017)	BUR1 (2021)	INDC (2018); NDC (2021)	No

1- Kazakhstan’s long-term Draft Doctrine of Carbon Neutral Development until 2060 (2021) will set a framework for a sustainable recovery, low-carbon development pathway, and energy sector transition.

2- Kyrgyzstan has recently started to develop its NDC Implementation Plan supported by UNDP Climate Promise project which will serve as the basis for LEDS

3 GHG Emissions Profile

According to the National Communication Reports published by the Central Asian States, the total amount of GHG emissions from the region in 2010 was approximately 612 million tonnes of CO₂ equivalent (excluding the land use, land-use, change and forestry (LULUCF) sector), which was nearly 1.4% of the world GHG emissions.

The region is energy-rich with large deposits of fossil fuels, especially natural gas. The energy sector is the highest GHG emitter in the region, especially in Kazakhstan and Uzbekistan followed by Turkmenistan.

Kazakhstan’s GHG emissions profile is similar to that of the UNFCCC Annex I Parties — industrialized countries and countries with economies in transition. Carbon dioxide emissions are the lowest in Tajikistan, and the proportion of methane emissions is the highest here, mainly originating from agricultural activities. The agricultural (Agriculture, Forest, and Other Land Uses sector) emissions in Tajikistan ranged between 36% and 45% of the national totals in 2010-2016.⁴ Kyrgyzstan also demonstrated higher than usual emissions value from the agriculture sector (34% of the national totals). These data indicate that the Central Asian countries might have different priorities about mitigation of GHG emissions by the economic sector, which should be considered when performing gaps and needs analysis in the inception phase of the project.

3 The Regional Impacts of Climate Change: an Assessment of Vulnerability, IPCC, 1998; retrieved at: <https://www.ipcc.ch/site/assets/uploads/2020/11/The-Regional-Impact.pdf>

4 GHG Forecasting in Key Sectors and Impact Assessment of Climate Change Mitigation Policies and Measures (Technical Report), UNEP 2020; retrieved at https://www.undp.org/sites/g/files/zskgke326/files/migration/tj/undp_tjk_Report_GHG_Projections_Tajikistan_2030.pdf

4 Current Status of Transparency Efforts - Gaps and Needs Analysis

The specific objective of the Gaps and Needs Analysis (GNA) is to describe existing arrangements and status for different climate MRV components and assess key gaps, and ways of improvement. The following climate MRV components were covered: GHG inventories (GHGI); GHG emissions projections; climate finance; adaptation and mitigation policies and measures (P&M).

The analysis is primarily based on open-source publications (National Communications, National GHG Inventories, Biennial Reports, Biennial Update Reports, and assessment and technical analysis reports for the national submissions to the UNFCCC, where available) and interviews with the personnel involved in the inventory production in each of these countries.

The overall view of the key challenges associated with the Climate MRV systems in the Central Asia Region is presented in Table 2 below.

Table 2. An overview of the challenges associated with Climate Change Transparency in the Central Asia region

Key challenges associated with Transparency	Problem Type	Climate change MRV system
Lack of coordination between organizations and institutions involved in different aspects of transparency work	Institutional arrangements	GHG Inventory, Adaptation
Lack of legal framework regulating the transparency process (except Kazakhstan)	National systems	Adaptation, Mitigation of GHG emissions, GHG inventory
Lack of robust data quality assurance and quality control system (except Kazakhstan)	QA/QC system	GHG Inventory
Limited knowledge of new modalities and procedures and new requirements for climate change reporting under the ETF under the Paris Agreement	MPG knowledge	GHG Inventory
Problems with data collection process, including institutional support, data requirements, data organization, data quality, and tools for data collection	Data institutionalization	Adaptation, Mitigation of GHG emissions, GHG inventory
Lack of clarity with identification and monitoring indicators to track progress to targets	Climate targets	Adaptation, Mitigation, Climate finance
Lack of clarity in identifying and setting up the process of monitoring relevant quantitative indicators for vulnerability and adaptation. For example, identifying major processes and key factors linked to vulnerability and adaptation sectors, especially in agriculture and food security, biodiversity, water resources, human settlements, and disaster risk reduction	Climate indicators	Adaptation
Sensitivity analysis of climate projections	GHG projections	Mitigation
Development and enhancement of the national adaptation plans	NAP	Adaptation

Lack of established capacity to maintain and update models and tools for developing and updating GHG projections (with possible exception of Kazakhstan)	GHG Projections	Mitigation
Limited accessibility to the major funding sources for targeted transparency projects and financial sustainability of the climate change MRV activities	Funding access	Climate finance
Lack of training and technical support materials in Russian language and national languages in Central Asia	Technical materials	Adaptation, Mitigation, Climate finance
Lack of experience in using dedicated tools for adaptation and mitigation	Tools	Adaptation, Mitigation

4.1 MRV Sector: Mitigation/GHG Inventory

4.1.1 Institutional arrangements and GHG inventory

All countries of Central Asia have a centralized inventory system where advanced inventory data processing, inventory production for all sectors, and inventory compilation are within the responsibility of the central inventory agency, while the raw inventory data are sourced from a multitude of other agencies and companies.

The inventory production and compilation process are project-based. As a result, none of the five countries has long-term interagency agreements between the central inventory agency and the data providers that would support seamless and timely data supply for the inventory production and compilation.

All five countries have *issues associated with activity data collection, processing, or documentation*. In Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan, the uncertainty values for the activity data are estimated using approach 1⁵ and with default values from the 2006 IPCC guidelines for most categories. Kazakhstan applies a mix of default and country-specific uncertainty values.

For most categories, countries use the 2006 IPCC tier 1 methodological approach with default IPCC emission factors and tailor the activity data and parameters accordingly. This includes both key- and non-key categories. In order to start gathering information that would enable the application of higher methodological tiers to key categories, at least four countries (Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan) would benefit from identifying the changes that need to be applied to key data requirements in order to shift to a Tier 2 methodology.

4.1.2 Gaps and needs for GHG inventories, by sector

4.1.2.1 Energy and Industrial Processes and Product Use (IPPU) issues

Energy: The energy sector produces the bulk of emissions across the region, and the energy sector categories form the major key categories in all five countries. That is why the availability of the energy balance data is essential for accurate GHG accounting in the sector. In addition, NDCs of all countries rely on the energy sector emission reductions (or intensity reductions) to fulfill the national goals under the Paris Agreement.

⁵ Uncertainties, 2006 IPCC GLs, V. 1, Ch.3, retrieved on 10/06/2022 from https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_3_Ch3_Uncertainties.pdf

Energy balance data are available only in three out of five countries – Kazakhstan, Kyrgyzstan, and Uzbekistan, and up to 2018 for Tajikistan conducted by IEA. But even in these three countries, there are substantial issues with the historical data availability dating back to the 1990s due to the geopolitical shift between the Soviet Union and forming independent States. Turkmenistan experiences challenges with data availability due to the absence of agreements between the central inventory agency and the AD vendors, especially in the gas sector.

An additional challenge for all countries except Kazakhstan is that they tend to use a top-down approach (known as the reference approach) for energy emissions calculations rather than a more accurate and reliable bottom-up approach (known as the sectoral approach). The 2006 IPCC Guidelines recommend using the sectoral approach for the base calculations and the reference approach for verification only.

Transport (road transport in all five countries and pipeline transport in Uzbekistan) are also listed among the top contributing key categories. The NDCs of all five countries involve mitigation measures associated with improving structure, fuel efficiency, and shifting toward less-emissive technologies. However, the analysis shows that all five countries experience challenges with detailed fuel statistics, especially for different types of liquid fuels as well as the data on mileage, which make the shift toward higher methodological tiers difficult. It also means that accounting for non-CO₂ emissions from road transport would not be very accurate even when applying a Tier 1 methodology.

For most countries, manufacturing and construction, and the other sectors category (usually, the residential category) are also key categories, which also heavily rely on the availability of the national energy balance, so the challenges here are the same as those in the energy industry categories. Additionally, fugitive emissions from oil and gas and coal operations are a key category for some countries (e.g., Kazakhstan, Uzbekistan, Turkmenistan). There are fuel pipelines that go across the regional territory, which contributed to the fact that Uzbekistan, for example, has emissions from pipeline transport almost at the same level as from road transportation. However, all countries experience challenges with disaggregating their energy balance sufficiently to produce accurate estimates of emissions from these categories and apply higher-tier methodologies.

IPPU: For most countries in the region, the Mineral industry, Chemical industry, and Metal production are the key categories in the IPPU sector. Most countries (except Tajikistan) also identified HFC emissions from ODS, especially from refrigeration and air conditioning as key categories.

The biggest challenge among all IPPU categories for all five countries is presented by the HFC emissions from ODS, especially the refrigeration and air conditioning category. Although none of the countries produces or exports HFCs, each of them has substantial amounts consumed through the use of HFC-based refrigerants for both stationary and mobile refrigeration and air conditioning. The data for these categories can be sourced from two major sources – the customs and the industry reports. Unfortunately (and this is true for many countries, including developed countries) the data from those two sources are often inconsistent with a large margin of error. The description for emission estimating is also quite complicated (e.g., requires the calculation of banks, while most of the activity data are focused on the consumption of HFCs). In addition, the most commonly used tool for emission estimating, the IPCC software, requires data entries in a form of individual chemicals, while the industrial data are most likely presented as amounts of commercial refrigerating blends (so-called R-blends).

This could be mitigated by using the appropriate activity data templates and dedicated software applications together with the relevant training in calculating HFC emissions from the category (including banks). From our prior experience with inventory production and reviews, industrial reports are usually more reliable than customs data as they are produced by industry specialists. That is why it is advisable to rely on the industry data as a base and use customs data for point checks and verification. Because reporting HFCs from the use and production of ODS is a mandatory category under the Paris Agreement, we recommend prioritizing activities associated with this category for this project.

4.1.2.2 AFOLU sector

This sector includes in fact two sectors – the agriculture sector and LULUCF sector. In the 1996 IPCC Guidelines these two sectors are presented separately, while the 2006 IPCC Guidelines consider them as one sector. Methodologically, this does not create any difference, but for the reporting purposes, a clear distinction between the two sectors (especially for agricultural soils) is important. The two different classification systems could present a challenge to the countries and can be easily resolved at the category level.

Agriculture: All five countries have livestock emissions as their key category. All countries list the Enteric fermentation category as a key, and some (Kazakhstan, Tajikistan) also list the Manure management category as a key. Both subcategories require the livestock annual population as a base AD, which defines a gap for data in: (i) Distribution of manure management systems across the climate zones; (ii) Dry matter intake and (iii) N content in animal diet. Among all five countries, only Kazakhstan is developing country-specific parameters for these categories, while other countries are using the Tier 1 approach, which is not good practice for key categories.

The other agricultural category of high importance is the N₂O emissions from agricultural soils. The analysis identifies gaps in these categories associated with data availability and engagement in the inventory calculations, specifically: (i) N₂O from managed Ag soils (data on the amount of organic N inputs applied to soils other than grazing animals; disaggregated data on crop residue burning), and (ii) Application of carbonate lime and urea to agricultural soils.

LULUCF: This sector presents multiple challenges for all five countries. Complex activity data and elaborate calculations create multiple technical difficulties in estimating emissions from the sector. The basic activity data required for accurate estimating of emissions from the sector include creating a reliable national land classification accompanied by up-to-date maps, national soil classification, building a land-use change matrix, and estimating changes in soil carbon. According to the matrix analysis, each of these types of data presents a challenge to the region.

Due to the absence of reliable calculations in the LULUCF sector, it is not included in the key category analyses and uncertainty analyses for most countries (excluding Kazakhstan), and the LULUCF categories are not clearly identified in the inventories.

4.1.2.3 Waste sector

All five countries have emissions of CH₄ from solid waste disposal on land as their key category, and for most countries, the CH₄ emissions from wastewater treatment and discharge category are also a key. Both the Solid waste disposal on land and Wastewater treatment and discharge categories require a wide spectrum of data to perform estimating emissions and use sophisticated models (e.g., first-order decay or FOD model for the SWDS). To enable the data collection, a strong system of interagency cooperation needs to be put in place, which presents a challenge for all five countries.

Wastewater treatment and discharge, especially industrial wastewater, shows significant data deficiency in all five countries. As the Wastewater category is key, a solid understanding of the parameters and data required for shifting toward higher tier estimations is of high relevance here.

The issue was discovered in the waste incineration and open burning category. As open burning practices are quite common in Central Asia, this category, although not a key in terms of GHG emissions, still may have a strong impact on the ecological status of the region and has the potential to become a key category (e.g., using trend assessment). Disaggregating data on waste incineration, therefore, could be a very useful technical exercise with this perspective in mind.

4.1.3 Recommendations

Summary of recommendations below is proposed to fulfill the gaps and needs identified during the analysis of GHG inventory/mitigation. A full list with detailed activities within the present project is provided in the full version of the GNA.

- Map existing data flows and identify specific roles, responsibilities of different organizations and agencies, and relevant contact details; note the frequency of data supply and mark when the data needed to be supplied to enable a smooth inventory production process
- Identify the forms for the data requirements and create the relevant templates to make data processing more efficient. Get feedback from the data vendors and provide the necessary training
- Document the steps that an inventory compiler must do, specific to each country, in order to produce the national GHG inventory in a form of the national system manual, supplement with the relevant templates, as needed
- Create an inventory communication plan for each step of its production and compilation. Include the steps for the inventory approval as needed in each country (country clinic)
- For each sector, clearly identify the methodological tier applied for emission estimates, and record the emission factors used (values, references), and the sources for the activity data
- For those countries that have not established the archiving system yet (Tajikistan, Turkmenistan) cooperate regionally and create a blueprint for a robust archiving system.
- Undertake a refresher training on estimating and propagating uncertainty for the inventory using IPCC templates. Create or update a quantitative uncertainty analysis to include all sectors and categories at the correct level of disaggregation.
- Undertake the refresher training on key category analysis (KCA). Update KCA including all sectors and identify the appropriate levels of disaggregation for each sector. Adjust the KCA templates; accordingly, for each category identified as key, identify the roadmap for shifting towards tier 2 methodology.
- For the energy balance, strengthen the AD archiving system and have all available data points for each fuel within one file, so that the missing data are easily identifiable.
- Take a refresher seminar and calculate, where possible, missing activity data in the energy balance using the IPCC splicing techniques.
- Identify and prioritize, where possible a shift from a reference approach-based to the sectoral approach-based energy GHG estimation for the fuel combustion categories.
- Apply the sectoral approach to the energy calculation, work out the difference between the results of the reference and sectoral approaches and analyze the reasons for the difference.
- Perform the analysis of all available databases (e.g., vehicle registration database) is needed to find out which data are available for fuel consumption in road transportation, how the vehicle fleet is structured, and how the distance traveled is distributed among different vehicle types.
- Identify the missing parameters for road transportation for shifting toward tier 2 and consider the possibility of running the relevant research projects for the relevant data acquisition.
- Make an accurate account of the available data and missing data points in the fugitive emissions category, identify the data required to shift to a higher tier, harmonize the AD obtained by different organizations, and establish stronger interagency cooperation to improve the data

quality and timeliness of data submissions. Engage in the regional cooperation to use regional emission factors or proxy data, if possible.

- Undertake training on the use of AD collection templates and establish the agreements with data vendors that the data are submitted in the appropriate form suitable for entering into the IPCC equations for estimating emissions. For the missing data, applying splicing techniques described in the 2006 IPCC Guidelines would help to resolve the interim situation
- Investigate if international data on industrial product import/export are available and use them for verification/ proxy AD to fill the gaps in time series for the mineral industries category.
- Train on processing the AD and estimating HFC emissions using specialized templates and tools.
- Investigate potential data sources for estimating HFC emissions (e.g., customs data, industry data). Investigate the possibility of using proxy data if the actual data is not available.
- Consider shifting to T2 for livestock emissions (at least, start with enteric fermentation). Identify the data and parameters that are required for T2, then identify which of those are currently available and which are missing. Make a plan to collect the missing data.
- Undertake a technical training session for the Manure management category, and write a methodical paper with step-by-step template instructions, which will help improve the situation.
- Undertake training sessions and regional technical activities on N2O emissions from the Ag soils.
- Undertake the training on the use of the land-use change matrix for LULUCF calculations
- Writing short technical guidance (with the help of a technical expert-consultant) on the use of the land-use change matrix for estimating emissions from the LULUCF sector.
- Undertake a training on solid waste disposal on land and the FOD model. Use default data to calculate the emissions from SWDS. Record your steps in a form of a short instruction manual
- Investigate the possibility of obtaining country-specific or region-specific parameters to enable T2 calculations of the SWDS emissions.
- Undertake a training on wastewater. Use default data and IPCC templates to calculate the emissions from the category. Record your steps in a form of a short instruction manual
- Investigate the possibility of obtaining country-specific or region-specific parameters to enable T2 calculations of the Wastewater emissions.

Proposed activities to implement recommendations outlined are detailed in [Section 6](#).

4.2 MRV Sector: Mitigation/GHG Projections

4.2.1 Gaps in GHG projections

GHG projections communicated by the Central Asian countries under the UNFCCC and the Paris Agreement extend to 2030 and in some cases to 2050-60 and are developed using a variety of modeling tools and approaches. Table 7 analyses how the countries meet requirements for GHG projections based on the Enhanced Transparency Framework format of the Biennial Transparency Report.

Table 3. General assessment of GHG projections of the Central Asian countries with respect with ETF requirements

Country	Model/ Methodology	BAU and WAM	Sensitivity Analysis (Y/N)	Projection of Indicators	Sectoral Projections	With and w/out LULUCF
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		projections (Y/N)				
Kazakhstan	TIMES/MARKAL	Y	N	N	Y	Y
Kyrgyzstan	Detailed economic sectors analysis and sectorial carbon EF with LEAP and SHAKYR models	Y	N	N	Y	Y
Tajikistan	LEAP, more recently "Mapping" emissions to GDP/population	Y	N	N	Y	Y
Turkmenistan	Detailed estimation of future emissions by sector and fuel, methodology for projection not specified	Y	N	N	Y	N
Uzbekistan	GACMO	Y	N	N	Y	Y

Based on our preliminary assessment, major GHG projection gaps in the Central Asian countries are as follows:

- **Sectoral representation:** some countries may need to further disaggregate their projections to better match the GHG inventory source categories and include sectors other than energy (Kazakhstan, Turkmenistan)
- **Timeframes:** most countries limit their projections to 2030, which is not sufficient for BTRs and LEDS (Turkmenistan, Uzbekistan, Tajikistan)
- **Sensitivity analysis and Projection of Indicators** all Central Asian countries need to conduct the sensitivity analysis and projection of GHG indicators in their BTR submission under the Paris Agreement
- **LULUCF:** projections of LULUCF sources and sinks for the most part are done in a fairly crude fashion (e.g., considered nearly flat in Tajikistan) and are lacking in some countries (Turkmenistan)
- **High-GWP gases:** It appears that most of the Central Asian countries have not developed separate projections of the High-GWP gases (e.g., HCFCs) lack due to difficulties with activity data which are expected to increase rapidly in case no targeted mitigation policies are implemented.

4.2.2 Recommendations

The following draft recommendations can be suggested for the Central Asian countries to address their gaps in developing GHG scenarios.

Recommendation for all countries:

- Regional harmonization:** given that economies, including energy systems, of the Central Asian countries are interdependent, it could be advisable to establish a regional collaboration mechanism for harmonizing major population, economic and energy sector assumptions across the countries when applicable.
- Better matching projections with GHG inventories.** As it is expected, all the Central Asian countries will be making decisive steps towards improving their national GHG inventories as part of the BTR preparation. It is recommended that the countries update their GHG projections using the same or similar GHGs and source categories as in the GHG inventory; this specifically applies to AFOLU sector and High-GWP gases.
- Sensitivity.** Some GHG projection models could be exceedingly sensitive to changes in a few input variables. It could be suggested to conduct the model sensitivity exercise to evaluate the robustness of the model results given the fluctuations of inputs and control parameters.
- NDC Progress Indicators.** It is recommended that the GHG projections include applicable NDC progress indicators to track the success of reaching the NDC targets.

- e. **Timeframe of Projections.** Given that the GHG projections for the purposes of NDCs need to extend at least to 2035 and for the purposes of LEDS to 2050-2060, the Central Asian countries need to extend and/or update their mid-term and long-term projections using most appropriate models and methodologies.

Country specific recommendations:

- a. **Kazakhstan.** Kazakhstan is using a set of international optimization models. The most recent scenarios to reach carbon neutrality by 2060 (in line with the 2060 Carbon Neutrality Doctrine) still need to be explained in greater detail and the LULUCF sector needs to be modeled more explicitly.
- b. **Kyrgyzstan.** In this country the basic data for the inventory and for the projections seems available and reliable, so it could be recommended the use of an international model, preferably an optimization model, given the long projection timeframes to 2050 and even to 2100.
- c. **Tajikistan.** The projection methodology can be improved, but it seems that in this country it is necessary to work on basic activity data necessary for the emission inventory, improving time series availability.⁶ A second recommendation is the use of a model (e.g., LEAP) to calculate future emission, starting from the available activity data. Projections to 2050 are also needed.
- d. **Turkmenistan.** It is recommended to increase transparency by describing the tools used for the calculations and to develop scenarios that foresee the use of low carbon technologies. The reliability of GHG projections to be increased using international models for the energy sector calculations. A specific calculation has also to be performed for the LULUCF sector. Projections to 2050 are also needed.
- e. **Uzbekistan.** The long-term scenario will be more reliable using an optimization model like TIMES. Projections to 2050 are also needed.

Proposed activities to implement recommendations outlined are detailed in [Section 6](#).

4.3 MRV Sector: Adaptation

4.3.1 Current status and needs for adaptation, by country

4.3.1.1 Kazakhstan

While some priorities and quantitative goals have been taken by the government to help develop energy sources, increase energy efficiency, and reduce climate impacts under national strategic plans, there is no formal climate strategy to date, or institutional arrangements for adaptation planning and implementation. There is currently no institutionalized adaptation monitoring and evaluation (M&E) system in place. However, Kazakhstan includes the development of a robust M&E system as a key priority of the NAP process to track progress, assess outcomes/impacts, and ensure accountability⁷.

The challenge of vertical integration needed to streamline adaptation planning has been assessed with the support of the NAP Global Network⁸, leading to a set of core recommendations for the RoK MEGNR, the agency that oversees the NAP process:

⁶ The latter is due to the fact that the previous GHG inventory dataset from 1990 to 2003 was calculated using the 1996 IPCC Guidelines, and from 2004 to 2016 using the 2006 IPCC Guidelines. The 2021 NDC update used the 2006 IPCC Guidelines from 1990 to 2018. Therefore, the renewal and harmonization of all GHGs has affected the GHG emissions of the base year, which is 1990, by increasing the total GHGs subsequently.

⁷ Readiness Proposal with UNDP for the Republic of Kazakhstan, Green Climate Fund – NDA Strengthening & Country Programming, 2 August 2017

⁸ Entry Points for Vertical Integration of Climate Action in Kazakhstan, NAP Global Network, May 2019.

- Shape the implementation discussion within the sustainable development goals (SDGs): Pursue the adjustment of high-level governmental strategic documents to have the explicit mention of adaptation needs as a mechanism for the integration of adaptation climate action into national and sub-national development programs.
- Provide proposals and expertise on vertical integration of the NAP process in the SDG implementation process: Make use of known best practices and existing support on enabling factors from international organization. Access support from peer learning, for instance from NAP Global Network.
- Initiate dialogue processes with the Ministry of National Economy and propose adjustments on current sub-national development programs: development plans as entry points for climate action at the sub-national level can only be integrated if other ministries—and especially the Ministry of National Economy, as key actors — are engaged. Specific adjustments of development plans, as discussed in this study, need to be proposed, discussed and in response to feedback, be modified.
- Design an institutional arrangement that covers the entire NAP process at multiple levels: Propose that scientific bodies of national ministries conduct the RVA and elaborate adaptation options. Propose that provincial departments be responsible for selecting and prioritizing adaptation options with the support of scientific bodies at the national level. Consider piloting sectoral and/or regional adaptation planning.
- Address capacity gaps at the national level: Provide scientific bodies of national ministries with methods and training on CRVAs and how to elaborate adaptation options. Ensure that methods are suitable for the context of Kazakhstan.
- Address capacity gaps at the sub-national level: Provide line departments at the provincial level with methods and training on how to select and prioritize adaptation options.
- Ensure the sustainability of knowledge and capacity transfer: Identify an institution for sustainable transfer of methodological knowledge into all provinces and sectors. Organize a “Training of Trainers” with support of international organizations that provides relevant methodological knowledge to this institution, which can be transferred to the provinces on a regular basis.
- Support for climate information and stakeholder involvement: Coordinate a dialogue platform between users and generators of climate information. Support of Kazhydromet and other scientific bodies to produce user-centered information on climate change scenarios and their impacts.

The indicators Following the results of the work on SDGs implementation at country-scale, a list of 17 goals, 169 targets and 297 indicators (with an additional 76 national indicators, 35 of which were proposed additionally) was approved. The indicators were then grouped into four further categories, including: (i) seven (7) relevant indicators that are the highest priority for policy implementation; (ii) One hundred thirty (130) Indicators to be monitored according to the implemented policy; (iii) Seventy (70) deferred indicators for which no methodology or baseline values currently exist; and Eight (8) were not relevant for the country. Regarding SDG13, the prioritized indicators for climate change (adaptation) include the indicator 13.1.1. that of *Number of deaths and persons affected by natural disasters*.

4.3.1.2 Kyrgyzstan

The Kyrgyz Republic expressed its political commitment and ambition in its climate change adaptation actions while updating the NDC in 2021. NDC adaptation measures were developed and presented in accordance with the three constituent elements of the global adaptation goal of the Paris Agreement (Article 7): (1) strengthening adaptive capacity, (2) strengthening resilience to the adverse impacts of climate change and (3) reducing the vulnerability of people and systems to the impacts of climate change effects. Kyrgyzstan NDC adaptation section includes sectoral and cross-sectoral measures that prioritize investments in adaptation.

The developed measures of the NDC will be the basis for the ongoing NAP process, the results of which will be integrated into the next NDC in 2025. In this regard, the time horizon for NDC adaptation measures

is set until 2025. The implementation of many adaptation measures depends on the successful mobilization of external funding. In this regard, some actions can only be initiated, but not fully completed within the planning horizon⁹.

The updated NDC contains a list of generic adaptation measures that will reduce the economic losses identified in the INDC and covers all the most vulnerable sectors: water resources, agriculture, energy, emergencies, public health, forests, and biodiversity. Additionally, two cross-sectoral components in adaptation were presented: i) “Climate Resilient Areas and Green cities”, ii) “Improving an Adaptation Reporting System”. During the NDC development, a set of recommendations were also developed for the establishment of the M&E system in Kyrgyzstan based on a nationally agreed methodology of the Vulnerability and Risk Assessment. The proposed scheme of M&E, so far, comprises three components: (i) M&E of the vulnerability and risk index value; (ii) M&E of the adaptation actions; and (iii) M&E of the support received- to be developed under the NAP process.

Barriers and gaps to the implementation of adaptation measures

Gaps, barriers, and obstacles were identified under the NAP development process¹⁰ and in many cases are referenced to the lessons drawn from the national projects.

At the national level, at present the **institutional framework and coordination arrangements for climate change adaptation** planning are weak and need strengthening. The main agency, which deals with the climate change agenda at the national level, lacks capacitated and professional staff to coordinate and oversee the climate reporting processes and ETF.

Mainstreaming of climate change adaptation into sector-level development plans of key institutions (water, agriculture, energy, forestry) is also lacking and requires capacitated staff and cooperation between the agencies. **Limited or out-of-dated legal documents and acts** are also barriers towards the implementation of adaptation measures. Most of them lack the clear regulations on transparency issues, M&E and ETF processes. **Deficiency of data and statistics on climate related activities** is also a challenge. Existing climate data is fragmented and incomplete, coming from many different sources that have different standards and formats.

Other barriers include **limited engagement with the civil society sector** and addressing **gender aspects** in the climate change reporting process. Lack of financial resources, coherence with relevant national development processes (e.g., SGDs) and promotion of vulnerability/adaptation processes at the provincial/subnational level are also issued within the key barriers and gaps.

During the NDC preparation, the development of indicators for the effectiveness of public policies with increased integration of gender equality principles was identified as an issue that needs to be addressed.

4.3.1.3 Tajikistan

The **National Strategy on Climate Change Adaptation (NSCCA) of the Republic of Tajikistan until 2030** was adopted by the Government of the Republic of Tajikistan on October 2, 2019 and became a strategic document for the implementation of the Paris Agreement. This strategy summarizes the information needed to identify risks, threats and adaptation measures to climate change and suggests mechanisms and sources of financing.

The NSCCA was developed based on: the targets formulated in the National Development Strategy 2030 (NDS 2030) framework, as well as taking into account the provisions of other fundamental documents, in particular, the Medium-Term Development Programme for 2021-2025, the preliminary results of the

⁹ Updated Nationally Determined Contributions of the Kyrgyz Republic, 2021; retrieved at:

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Kyrgyzstan%20First/OHYB%20ENG%20ot%2008102021.pdf>

¹⁰ GCF Readiness Proposal NAP, UNDP 2020.

Fourth National Communication of the Republic of Tajikistan to the UNFCCC (2021), sectoral programmes and strategies, research carried out by development partners, as well as consultations with specialists from key ministries and departments; long-term adaptive measures were identified for its implementation in the key sectors of the economy.

The Government of Tajikistan has prioritized four sectors that are both climate sensitive and development priorities: **i) energy; ii) water; iii) transport; and iv) agriculture**. Those priorities were identified through national consultations on the formulation of the NSCCA, taking into account vulnerability to climate change and development priorities; seven cross-cutting areas were also highlighted: (1) health, (2) education, (3) gender, (4) youth, (5) migration, (6) environment, and (7) emergencies. A detailed list of adaptation measures for all priority sectors is referenced in the NSCCA.¹¹

The existing M&E system of the National Development Strategy can be fully used as a tool for tracking the progress of the adaptation measures at national, regional, and sectoral level. However, the substantial improvements should be done in the areas of new or modified laws, directives to enhance a process of transition to ETF; data management (lack of data and data quality; data collection and processing); strengthening institutional arrangements, including involvement new cross-sectoral teams (across government and between public agencies and the private sector); integration of the current scattered monitoring and reporting systems; increasing human capacity; access to technology and access to financial resources.

Barriers and gaps to the implementation of adaptation measures

Based on the analysis of strategic documents, the main barriers, problems, and gaps in the implementation of adaptation measures include financial, capacity building and the introduction of new technologies.

In terms of **financial barriers and problems** there is a lack of long-term development plans and effective allocation of resources, no clear mechanism for tracking financial resources aimed at adaptation and mitigation activities, both from development partners, as well as from the private sector, and the contribution of the government. Also, there are practically no market mechanisms for attracting financial resources to address the climate change agenda.

Analysis of available technological solutions in Tajikistan shows that they cover only the agricultural and water sectors (irrigation technologies, that is, technologies for water-saving and processing of agricultural products), as well as housing conditions of the population. While the transport sector and disaster risk management, technologies are not included in this list. This can be attributed to the barriers and **challenges on capacity building and technologies**.

4.3.1.4 Turkmenistan

The National Climate Change Strategy (NCCS) of 2012 laid out the policy framework for building climate resilience through adaptation and a low-emission economy through mitigation. The strategy reflected the most pressing issues at the time. However, reflecting the rapid environmental and natural resource changes in Turkmenistan's that had taken place since 2012, the NCCS was updated in 2019 and provides for the implementation of systemic measures to address climate change and aims to ensure sustainable development. It also sets the strategy for developing an effective and coordinated process of climate change adaptation of all priority sectors and developing effective mitigation measures that contribute to accelerating Turkmenistan's low-carbon development.

¹¹<https://leap.unep.org/countries/tj/national-legislation/national-strategy-adaptation-climate-change-republic-tajikistan#:~:text=Policy-National%20Strategy%20for%20Adaptation%20to%20Climate%20Change%20of%20the%20Republic,land%20tenure%20and%20food%20security.>

The updated Strategy acknowledges that climate change is accelerating the challenges the country faces, especially those that require adaptation. It stresses the necessity to take appropriate activities for long-term planning to mitigate climate risks in vulnerable sectors. It also foresees developing adaptation measures to be reflected in long-term national strategies, plans and country development programs, designed to consider scenario planning methods. **It also tables the need to begin preparing regional and sectoral adaptation plans.**

The NSTCC has identified the water and agriculture sectors as being most affected by climate change, along with health, soil and land resources, ecosystems, and forestry. It defines key priorities of action for those sectors for some sectors; detailed information is available directly in the NSTCC document¹² (including lists of measures).

The NAP process in Turkmenistan will be complementary to the National Climate Change Strategy as it would unpack and operationalize a long-term vision for adaptation and promote coordinated process for adaptation planning. It would intervene in identifying risks, vulnerabilities and adaptation options in the water sector in two major locations as well as provide tools and methods to be replicated across the country.

Turkmenistan, in its UNFCCC reporting through the NC and NDC, already develops and reports on adaptation activities. In 2021, UNDP provided recommendations on the design of the ETF for adaptation in Turkmenistan¹³; it is recommended that the Government of Turkmenistan adopts an integrated system of mitigation and adaptation reporting.

4.3.1.5 Uzbekistan

The Strategy for the transition of the Republic of Uzbekistan to “green” economy for the Period 2019-2030 (Resolution of the President of the Republic of Uzbekistan No PP-4477 dated October 4, 2019)¹⁴ is the main legislative document regulating policy and actions in the field of climate change. The Strategy was adopted in order to ensure the fulfillment of obligations under the Paris Agreement and includes the following priorities: improving the energy efficiency of the main sectors of economy; diversification of energy consumption and development of the use of renewable energy sources; climate change mitigation and adaptation, increasing the efficiency of using natural resources and preserving natural ecosystems; development of financial and non-financial mechanisms to support the development of a green economy. The strategy provides for preparation of the annual plan/roadmap.

A Strategy of the Republic of Uzbekistan on Climate Change until 2030 is under development – as well as a roadmap and investment plan accordingly. The main goal of the Strategy is to ensure sustainable socio-economic development of the Republic of Uzbekistan under conditions of climate change. The key priority areas of the Strategy are defined as follows: reducing intensity of greenhouse gas emissions in accordance with national capabilities, conditions, and circumstances; building resilience to climate change and disaster risk management; strengthening adaptation measures and actions in the Aral Sea region; development of systematic climate change monitoring, assessments and forecasts; introduction of innovative resource-saving technologies and capacity building in vulnerable sectors of the economy for climate change mitigation and adaptation. Section 2 on adaptation to climate change provides a list of target sectors: water resources/water sector; agriculture; extreme weather events caused by climate change; health; ecosystems/forestry; Aral Sea region.

¹² National Strategy of Turkmenistan on Climate Change | UNDP in Turkmenistan

¹³ UNDP, Designing an MRV System for Climate Change Adaptation Action in Turkmenistan, 2021.

¹⁴ www.gov.uz

With the support of UNDP – through a GCF-funded project “Sector driven National Adaptation Plan to advance medium- and long-term adaptation planning in Uzbekistan”, adaptation planning will be strengthened and adaptation is prioritized into national and sectoral planning and budgeting – including through five sectoral plans (water and agriculture, extreme hazards, health, housing) and two territorial plans.

The MRV of adaptation actions is planned to be developed as part of the preparation of the National Adaptation Plan of the Republic of Uzbekistan in 2021-2022, since by developing national adaptation plans, one of the mandatory components is the creation of an M&E system, including: assessing impacts, vulnerabilities, and risks. The challenge is to develop indicators for assessing the implementation of adaptation measures. One of the gaps is lack of technical expertise and knowledge to establish an adequate set of indicators for adaptation actions to be monitored and tracked.

Barriers and gaps to the implementation of adaptation measures

Key barriers have been identified under the UNDP/GCF project – to be addressed during development of the NAP – as follows:

- **Lack of a framework to govern climate change:**
 - There is no single institution charged with coordinating climate change adaptation.
 - Existing policies and strategies only marginally cover protection of the climate system and mainly focus on clean air.
 - Through national sustainable development goals and draft legislation on renewable energy sources, a greater focus has been afforded to mitigation actions with a vision to reduce consumption and energy-intensity. There is no overarching framework to govern climate change adaptation.
 - None of the priority economy sectors in Uzbekistan have adaptation plans or components in their development plans.
- **Limited technical skills and institutional capacity:**
 - Apart from the rapid skills assessment undertaken during the UNDP-UNITAR-led stocktaking mission, no technical capacity assessments have been undertaken for climate change integration in key ministries.
 - There are no regulatory documents, provisions to assess climate risks at the regional level.
 - Economic valuation or analyses are not systematically employed to appraise or prioritize adaptation interventions in the country.
- **Lack of harmonized data collection and distribution:**
 - The Intersectoral data coordination system is insufficient to collect and disseminate the information in an easily digestible manner.
 - There is no functional communication strategy for climate change in the country.
- **Limited capacity to monitor climate change adaptation investments:**
 - There is limited understanding of climate change adaptation measures’ effectiveness. Likewise, monitoring and evaluation through identification of methods of evaluation for adaptation interventions is lacking. A general lack of climate adaptation related expenditures tracking.

4.3.2 Main gaps and needs for adaptation in Central Asia

Based on an in-depth analysis of all 5 countries’ situations on transparency practices regarding adaptation, key transverse results are summarized below – even if the situation may differ significantly from one country to another.

Priority sectors for all countries of Central Asia on adaptation:

- Water is by far the most critical sector for adaptation in all 5 countries
- Agriculture, forest, health, and Disaster Risk Reduction are also common priorities
- The energy sector is an emerging priority (in interaction with the water sector) as the regional potential for hydroelectricity is very high but may be threatened by climate change; it is clearly identified as a priority in Tajikistan, where the areas of production and transmission of electricity are sensitive to climate change and extreme climatic events. Since energy and water systems are interconnected, changes in precipitation, high risk of drought, reduced snow cover and different times of snowmelt can negatively affect the production and supply of electricity.
- Specific concern regarding resilient urban development is highlighted by Kyrgyzstan and on transport & infrastructure by Tajikistan
- Regarding geographical priorities, the Aral Sea region appears to be highly vulnerable to Climate Change; specific challenge is the stabilization of the environmental situation by the method of forest reclamation of sand formations on the drained bottom of the Aral Sea, subject to ash salt-dust transfer (with air pollution consequences).

Main gaps on adaptation transparency /monitoring and evaluation, which have been summarized for the Central Asian region, are:

- Lack of clear institutional arrangements and potential overlap between institutions' mandates
- Need for a consistent multi-scale reporting process (local/Sectoral/national) against a common set of indicators
- Need for economic valuation or analyses to help appraise or prioritize adaptation interventions in the country
- Lack of technical skills and institutional capacity (even if a number of initiatives include capacity building actions)
- Lack of harmonized data collection and distribution and potentially lack of free access to data such as hydrometeorological data
- Lack of climate projections and models with higher resolution for projection of extreme events and their impact on economy and human health
- Lack of functional communication strategy for climate change
- Lack of climate adaptation related expenditures tracking and of effective allocation of resources
- Lack of information systems to draw lessons from indigenous knowledge
- Lack of system to report on adaptation under the UNFCCC

4.3.3 Recommendations

Building on lessons drawn from other countries' situations, the following key recommendations for improvement in Central Asia are proposed:

- **Develop a common methodological MRE framework for all 5 countries** aligned to international recommendations and feedback: we recommend a process enabling countries to monitor and demonstrate their adaptation actions based on a «proximity-to-target» approach¹⁵ - i.e. **developing a sectoral (or programme) results-based management framework for adaptation per country with sets of indicators designed accordingly (output and outcome indicators)**. Such a process should be aligned to / designed in collaboration with SDG frameworks (see next recommendation) and with the NAP or adaptation strategy processes (see last recommendation).
- Shape the implementation discussion with SDG working groups on climate change policy and promote the adjustment of high-level governmental strategic documents: the explicit mention of adaptation

¹⁵ Approaches to reviewing the overall progress made in achieving the global goal on adaptation - Technical paper by the Adaptation Committee, UNFCCC, 2021

needs in high-level strategic documents represents a strong leverage mechanism for the integration of climate action into national and sub-national development programs and in the monitoring systems accordingly. Ensure synergy with SDGs reporting processes – even if reporting on SDG 13 indicators is still limited

- Design clear institutional arrangements that cover adaptation mainstreaming at multiple levels – including for monitoring and evaluation purposes; develop the regulatory framework (regulatory documents) accordingly
- Address capacity gaps at the national and sub-national level: Provide scientific bodies of national ministries with methods and training on how to track adaptation action.
- Ensure the sustainability of knowledge and capacity transfer: Identify an institution for sustainable transfer of methodological knowledge into all provinces and sectors. Organize “Training of Trainers” with support of international organizations that provide relevant methodological knowledge to this institution, which can be transferred to relevant stakeholders on a regular basis. Capacity building efforts taking into account effective needs (i.e., based on capacity gaps assessment)
- Support for climate information and stakeholder involvement: Coordinate a dialogue platform between users and generators of climate information with support of scientific bodies to produce user-centered information taking into account climate change scenarios and their impacts.
- Take profit from projects’ M&E systems (including data collection and processing)
- Promote the use of new technologies (radar stations, remote sensing data), better performance and interaction between early warning systems and emergency management teams
- Build on good practices and lessons learnt (see examples below)
- Cross-cutting and general recommendations concern the operationalization of efforts regarding the design of monitoring and evaluation systems for adaptation, taking profit from the fact that 4 out of 5 countries are currently developing or implementing a NAP process or a national adaptation strategy (see annex 1) with the support of technical and financial partners – more particularly UNDP with GCF funding through readiness support. Common design of adaptation M&E frameworks may facilitate and strengthen the national systems, building on existing initiatives such as the M&E component of the Kyrgyzstan NAP - under development; it may include the definition of a common set of indicators and the mutualization of data collection and processing – using modern information technologies.

Proposed activities to implement recommendations outlined are detailed in [Section 7.1](#).

4.4 MRV Sector: Mitigation/ Policies and Measures

4.4.1 Mitigation gaps

Table 4. Main gaps and barriers regarding mitigation P&M transparency/monitoring, reporting, and verification

Priority	Gaps and barriers
<i>Regulation and institutional gaps Roadmap, strategy</i>	<ul style="list-style-type: none"> ● Lack of clear institutional arrangements and potential overlap between institutions’ mandates ● Lack of a legal document regulating the coordination of all involved organizations and stakeholders in relation to climate reporting. ● Absence of legislative act on regular provision of relevant information by stakeholders. ● Lack of memorandum of cooperation to improve coordination and information exchange between stakeholders.
<i>Technical knowledge, capacity building</i>	<ul style="list-style-type: none"> ● Lack of experts, as well as insufficient knowledge of local specialists in GHG mitigation. ● Lack of awareness among decision makers and stakeholders regarding reporting on CC mitigation measures and support received. ● Low awareness of experts at the level of organizations. ● Experts from the organizations cannot provide the full required information, as they do not have relevant skills. ● Lack of information to develop the roadmap for long-term sectoral strategy.

<i>Guidelines, methods, tools</i>	<ul style="list-style-type: none"> • Absence of quantitative characteristics by which abated emissions can be calculated when reporting on activities and programs. • There is not enough information as well as methods and approaches to obtain information to track progress towards the implementation and achievement of NDC. There is no corresponding regulatory document. • No annual emission reduction reporting in most cases. • There is not enough information about the status of projects (Databases). • Lack of information on the cost of mitigation measures, co-benefits and how these measures interact with other mitigation actions. • Lack of information on projects' implementation progress. • In the project documents no attention is paid to indicators for assessing GHG emission reductions. • There are no reporting forms on measures to reduce GHG emissions.
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4.4.2 Recommendations

Table 5. Recommendations to address mitigation P&M transparency/monitoring, reporting, and verification

Priority	Opportunities and recommendations
<i>Regulation and institutional gaps Roadmap, strategy</i>	<ul style="list-style-type: none"> • Improvement of the legislative framework. • Improvement of institutional structures. • Creation of a national system for monitoring greenhouse gas emissions and P&M impacts. • Development of MoUs to assure the data exchange among stakeholders. • Strengthen integration of climate change issues into national policies and interagency coordination on these issues.
<i>Technical knowledge, capacity building</i>	<p>Set up of a system for advanced training of officials and personnel of ministries and departments involved in the preparation of all types of reporting to the UNFCCC, the preparation of strategies and plans; Annual reporting of planned mitigation activities from the organizations involved is required, with indication of quantitative indicators.</p> <ul style="list-style-type: none"> • Improvement of the GHG emission forecast model is required. • Development of strategic documents on low-carbon development. • Strengthen institutional capacity for the regulation and control of GHG emissions and training in NDC areas. • Support the development of the list of climate data in the official national statistics systems. • Strengthen monitoring of financing for climate action. • Enhance institutional and technical capacity to develop, maintain and update emission projections for the future (up to 2050)
<i>Guidelines, methods, tools</i>	<ul style="list-style-type: none"> • Set up sustainable MRV systems, learning from international experience and developing a methodology for selecting indicators and assessing the implementation and effectiveness of mitigation P&M. • Develop procedures for conducting a national GHG inventory, tracking P&M: collecting and processing data, their subsequent verification, requirements for the qualifications of verifiers, storage, and archiving issues. • Develop methodological guidelines to estimate mitigation action impacts (ex-ante and ex-post). • Develop tabular formats to collect the necessary information on all components of the MRV system. • Develop reporting forms and indicators to track progress in the implementation of mitigation measures. • Introduction of financial mechanisms which encourage reduction of greenhouse gas emissions.

Proposed activities to implement recommendations outlined are detailed in [Section 6](#).

4.5 MRV Sector: Climate Finance

4.5.1 Needs in climate finance

4.5.1.1 Climate finance needs articulated in Nationally Determined Contributions

All five project countries have outlined climate finance-related needs in their Nationally Determined Contributions (NDCs) as summarized in Table 20. Countries are at different stages of costing the mitigation and adaptation actions brought forward in their NDCs. The NDC of the Kyrgyz Republic contains an estimate of investments required for the implementation of individual adaptation and mitigation actions.

One country (Kazakhstan) communicated in its NDC the intention to use Article 6. Since then, regional workshops took place and more countries have signaled their interest in participating in cooperative approaches under Article 6.

Table 6. Climate Finance needs to be articulated in (updated) NDCs (own compilation from country NDC documents).

Country	NDC Provision
Kazakhstan	A 25% reduction in GHG emissions by 31 December 2030 compared to the base year, subject to additional international investments, access to low carbon technologies transfer mechanism, green climate funds and flexible mechanism for countries with economies in transition. Kazakhstan supports the inclusion of market-based mechanisms in the 2015 agreement, and the opportunity to use carbon units recognized by the UNFCCC. Kazakhstan retains the option of using market-based mechanisms under the UNFCCC. Kazakhstan will consider adequately discounting international units for compliance to ensure a contribution to net global emission reductions.
Kyrgyzstan	The overall estimated cost of the implementation of mitigation and adaptation actions will total at around USD 10 billion including 37% coming from own resources (funding by the private sector, international donors, and the national budget) and 63% sought in the form of investments of international financial assistance. NDC includes cost assessment of resources required broken down to nationally mobilized resources and international support.
Tajikistan	The updated information on Tajikistan NDCs consists of mitigation contributions to be implemented with its own efforts and conditional contributions that rely on adequate international support, namely financial and technical support, technology transfer as well as capacity building. The whole supporting package will accelerate the mitigation efforts and adaptation practice in the Republic of Tajikistan. There is no clear mechanism for tracking financial resources aimed at adaptation and mitigation activities, both from development partners, as well as from the private sector, and the contribution of the government. In order to solve this problem, the development of indicators is required to determine the contribution of development partners, the private sector and the government. Monitoring procedures should include procedures for budgeting national and subnational funding sources. In the Republic of Tajikistan, there are practically no market mechanisms for attracting financial resources on climate change issues (renewable energy market certificates, emission trading mechanisms, environmental insurance)
Turkmenistan	Means of implementation is primarily the state budget of Turkmenistan. Project proposals and measures providing the necessary level of reduction of GHG emissions were designed in the framework of preparation of the Third National Communication and National Action Plan to reduce greenhouse gases. The country's economy has the potential to further reduce emissions of greenhouse gases, but in this case, the country will need additional financial resources and technological support. With a certain international support, Turkmenistan could achieve zero growth in emissions and even decrease their emissions until 2030.
Uzbekistan	Achievement of the long-term goal is envisaged with the support of international organizations and financial institutions, access to advanced resource-saving and environmentally friendly technologies, and climate finance resources.

4.5.1.2 Needs articulated in Biennial Update Reports and National Communications

Key gaps and needs outlined by countries in their biennial update reports and national communications include the following:

- Development of a data collection system for climate finance in line with international criteria (Uzbekistan)
- Identification of indicators to quantify support provided/received (including technology transfer and capacity building (Uzbekistan)
- Increase the capacity of national experts for assessment and prioritization of mitigation measures based on cost-benefit analysis through their implementation (Uzbekistan)
- The need to establish national processes for identifying technology needs in order to address climate change issues and report them in the BUR (Tajikistan)

4.5.2 Recommendations

Climate finance is a critical component for countries in Central Asia to accelerate the implementation of mitigation and adaptation actions. It serves as a catalyst and bridge between ambition and national climate action. All countries have articulated climate financing needs and strategies to mobilize investments for climate actions in their Nationally Determined Contributions (NDCs). This includes general estimations for resources required to implement unconditional and conditional NDC targets. Some countries also communicated the need for building tracking systems for finance flows. One NDC (Kyrgyz Republic) includes costing for the implementation of mitigation and adaptation measures.

Needs and gaps in climate finance vary between countries in Central Asia as they are at different stages of creating a climate-compatible financial system. While Kazakhstan is working on creating a regulatory framework for green finance in the form of a green taxonomy, other countries have articulated more basic needs such as strengthening of capacities to apply cost-benefit analysis for mitigation measures or developing cost estimates for the implementation of individual NDC actions. One country (Uzbekistan) also highlighted the need to develop a data system and respective indicators for tracking climate finance flows, while another country (Tajikistan) is already working on establishing such a system with the support of the GCF. The differences in countries' capacities on climate finance suggest that peer-to-peer learning or mentoring approaches between countries might provide a useful approach to stimulate learning and regionalisation of successful initiatives.

Central Asian countries receive climate finance-related support through several bilateral and multilateral projects, partnerships, and initiatives. Except for Turkmenistan, all countries are currently developing **Integrated National Financing Frameworks**. These form financing and implementation plans for national sustainable development strategies and potentially contain several connecting points to climate finance. Enhancing regional coordination between Central Asian countries is also the objective of the **Green Central Asia Initiative** which inter alia supports building capacities for developing project proposals for the **Green Climate Fund (GCF)**. All ReCATH countries do have active readiness or full projects under the GCF, including projects that target several Central Asian countries such as the *Climate Adaptation and Mitigation Program for the Aral Sea Basin* project which is supported with USD 19 million by the GCF. Among readiness projects, a strong focus is on supporting Adaptation Planning with several grants supporting the formulation and implementation of National Adaptation Plans (NAPs). Technical Support under the **NDC Partnership** includes inter alia the development of a green taxonomy in Kazakhstan and tracking and monitoring of NDC-related support by donors in Tajikistan.

In terms of mobilizing climate finance, the **UNFCCC Needs-Based Finance (NBF) project** currently supports the development of a regional climate finance access and mobilization strategy for Central Asia and South Caucasus region. A pre-validation workshop for the results took place in late 2021.

Against this background recommendations for the climate finance component of the ReCATH project include the following:

- Closely cooperate with the INFF and NBF projects to maximize synergies. Both projects come to an end in 2022, providing an opportunity for the ReCATH project to pick up recommendations of these projects and closing any analytical and implementation gaps for climate finance mobilization. Both the INFF and NBF projects are implemented within Joint Programmes of the UN.
- Explore opportunities to scale up and regionalize the on-demand support delivered by the *Green Central Asia Initiative* for project proposal development. Focus on complementing this work by building capacities for applying scientific and economic data in proposal development and institutionalizing these capacities within the region.
- Explore options for setting up a workstream to strengthen countries' capacities in costing investments required for implementation of adaptation and mitigation actions formulated in their NDCs.
- Explore options for a regional approach in implementing the *Climate Finance Mobilization and Access Strategy* that will be developed under the *UNFCCC NBF* project and link it to concrete adaptation and mitigation actions formulated in countries NDCs.
- Support countries in identifying indicators and setting up data-systems for tracking climate finance flows.
- Facilitate peer-to-peer learning and mentoring approaches among countries on climate finance related topics to reflect that countries are at different stages providing opportunities to learn from success stories and lessons learned of their peers.

Proposed activities to implement recommendations outlined are detailed in [Section 6](#).

4.6 Gender and Climate Action

UNFCCC recognizes the importance of involving women and men equally in UNFCCC processes and in the development and implementation of national climate policies that are gender-responsive, i.e., ensure that gender is taken into account in climate change planning and action. Integrating a gender approach into the analysis and decision-making processes in the field of sustainable development and climate change is important due to the fact that women and men react differently to changes in the state of the environment and may be affected in different ways according to the consequences of climate change. In households, especially those in rural areas, the main burden in the field of the availability and delivery of water for domestic needs and the provision of fuel for heating and cooking falls primarily on women and children. As climate change increases, these challenges become more complex. Women often face difficulties when it comes to accessing financial resources, capacity building activities, and technology transfer. Women are often underrepresented in climate change decision-making at all levels. This severely limits their ability to contribute to the implementation of solutions and apply their knowledge.

Specifically, representation of women and relevant gender focused entities will be ensured throughout the implementation of this project, including workshops and seminars. Sections below describe each country's activities in addressing gender parity in climate action. This is a cross-cutting issue that will be incorporated within all MRV activities in the project.

4.7 National MRV Stakeholders

In all countries of Central Asia, the Ministries or Committees on environmental protection or Agencies on Hydrometeorology are the key appointed governmental bodies, which deal with climate policy agenda

and therefore are responsible for data collection, monitoring, reporting and transparency. The following state bodies are officially appointed as UNFCCC focal point agencies in the region (Table 7):

Table 7. Central Asia country UNFCCC focal point agencies

Country	Focal point agency
Kazakhstan	Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan (MEGNR)
Kyrgyzstan	Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS)
Tajikistan	Agency for Hydrometeorology of the Committee for Environmental Protection under the Government of the Republic of Tajikistan (Tajhydromet)
Turkmenistan	Ministry of Agriculture and Environmental Protection of Turkmenistan (MAEP)
Uzbekistan	Centre of Hydrometeorological Services of the Republic of Uzbekistan (Uzhydromet)

The comprehensive mapping analysis was prepared to discuss key national, regional and international stakeholders, who address transparency actions in their agenda, as well as to highlight key gaps and barriers towards implementation of their climate reporting commitments under the Paris Agreement.¹⁶ The present chapter aims to emphasize on those gaps, which seem important for all five countries of Central Asia:

1. **Institutional gaps**, which are associated with coordination and intradepartmental cooperation in terms of data and information access, set-up of unique data collection system on GHG emissions (e.g. national statistics cadastre of GHG emission data).
 - a. *Coordination and intra-departmental cooperation* is the biggest challenge in overcoming the institutional barriers. There are no coordination and regulation mechanisms on managing the collection of GHG emission data almost in all countries of Central Asia
 - b. Lack or *limited institutional memory* and *high turnover* of professional staff are closely related, and attributed to the institutional gaps
2. **Legal barriers** in the form of *limited or no legal acts or basis for data collection* and exchange are key challenges towards the implementation of the climate transparency issues.
3. **Limited finance resources** are usually claimed as the biggest gap in fulfilling the climate change agenda. The countries of Central Asia are usually dependent on international funding to implement their national climate change commitments and require technical support to fulfill the obligations under the Paris Agreement on ETF and MRV.
4. **Fragmented knowledge and technical capacities** on climate transparency and MRV/ETF are regular issues in Central Asia. Coupled with financial issues above, the limited knowledge on formats and new requirements of reporting and accounting and access to practical guidelines on MRV add to the problem.
5. **Stakeholder engagement process** is sometimes challenging in Central Asia. Observations show that the decision-making process on climate policy/reporting does not overwhelmingly engage civil society and the private sector, which in turn impacts the quality of the produced outputs.
6. **Other gaps and issues**, which correlate with the *limited or no reporting on gender aspects* within the climate change transparency mandates and *limited access to the methodologies* and tools on climate transparency and accountability in Russian.

The proposed recommendations, which would help to mitigate the highlighted barriers and gaps, are mostly re-confirming the technical and content-wise solutions and actions mentioned across the present report (GHG Inventory/Mitigation, Adaptation, Projections, and Climate Finance) with the focus on

¹⁶ Please, use the link to the comprehensive report on [key stakeholders mapping analysis](#) with annexes (matrix)

capacity building exercises, support in **enhancing the legal and institutional set-up on transparency**, and **synergizing with similar initiatives on climate transparency** by *building on good practices*, promoting *regional cooperation* and introducing *elaborate methodologies and tools* to improve the quality of climate reporting in Central Asia and fulfill the obligations under the Paris Agreement.

5 Summary of Recommendations: Training And Technical Support Program

5.1 GHG inventories

Training activities: GHG inventories				
Action code	The context	Method	Output	The effort required*
GHG11	<p>Strengthening Institutional Arrangements (IA)</p> <ul style="list-style-type: none"> • Introduction on key elements of the institutional arrangements and 2006 IPCC requirements and how they should be reflected in the inventories • How do we know that IA are working well? – a Plenary discussion on indicators of IA work • Hands-on exercise: map institutional arrangements in the Central Asian countries to the inventory production cycle, assess the performance of the IA using the identified indicators; and identify strengths and weaknesses of the current system • Plenary discussion – actions we can take to improve IA • Produce practical recommendations on addressing issues associated with IA • Identify the input data sets required for the policy assessment & data sources <p>Documenting Institutional Arrangements</p> <ul style="list-style-type: none"> • Introduction of the US EPA toolkit on National Inventory System • Hands-on exercise: apply the templates to document key elements of the NIS of each CAREC State using most recent GHG inventory. • Plenary discussion: improving the template to better reflect the national information and identify the potential gaps 	<p>Mixed live and online attendance from all the 5 Central Asia countries</p> <p>1-2-day training sessions</p> <p>The participants need to familiarize themselves with the NIS description according to their latest available GHG inventory</p>	<p>Recommendation on specific actions to strengthen IA for GHG inventories for each of the Central Asian countries</p> <p>Formalized tabular record of the institutional arrangements for the NIS for each CAREC State</p> <p>Recommendation on improvement of NIS documentation</p>	<p>6 hours for delivery + 18 hours for preparation; Total 24 hours</p>

GHGI2	<p>Data management for GHG inventories</p> <ul style="list-style-type: none"> • Preparation (assignment): how data is managed under the current IA (based on homework submissions), including software tools, processing procedures, stakeholder engagement, challenges, and experiences (the participants will be responding to the survey questions) • Plenary: discuss lessons learnt from the assignment identifying <ul style="list-style-type: none"> ○ strengths and weaknesses of the current system ○ the need for the changes in data management mechanisms ○ the tools that might be helpful for better data processing • Good practices in data archiving and documentation associated with GHG data collection and processing and include a practical exercise to identify issues associated with archiving and documentation in a given case study. • Examples of tools that might be useful for data collections and archiving. 	<p>Mixed live and on-line attendance from all the 5 Central Asia countries 1-2-day training sessions Participants need to complete the assignment prior the session (within 2 weeks)</p>	<p>The individual and compiled Survey results with basic analysis of current data management systems in 5 Central Asian countries</p>	<p>6h for delivery + 18 h for preparation; 1.5 x 2 Q&A and assignment guidance 6 hours of preparation & materials 8 hours for follow-up guidance and feedback on deliverable; Total 35 hours</p>
GHGI3	<p>Introduction to the data collection tools for specific sectors</p> <ul style="list-style-type: none"> • Introduction to data management tools (with exercises) • Data acquisition and adaptation + hands-on exercise using the example selected by participants • Case Study - interactive hands-on exercise on data adaptation (Agriculture, energy) • Hands-on training: to data collection templates • Hands-on training: data collection tool (SAGE) 	<p>Mixed live and online attendance from all the 5 Central Asia countries 2-3-day training sessions The participants need to prepare activity data sets for practical session</p>	<p>Session report</p>	<p>9 hours for delivery + 27 hours for preparation: Total 36 hours</p>
GHGI4	<p>Template design session</p> <ul style="list-style-type: none"> • Presentation on making templates basics • Applying the basic principles of template making to climate change MRV areas selected by the participants 	<p>Mixed live and online attendance from all the 5 Central Asia countries 1-day training sessions The participants need to identify the key priority areas where they'd like to design a template for data management.</p>	<p>A simple template to assist calculating the estimates for the identified climate MRV priority areas</p>	<p>4 hours training + 12 h preparation & follow-up; Total 16 hours</p>

<p>GHGI5 (a – f)</p>	<p>Sector-specific advanced tutorials on estimating emissions for categories of a particular interest (specific sectors/categories will be identified by the stakeholders) based on the 2006 IPCC Guidelines. Identified points of interest: <i>a. Estimating non-CO₂ emissions from road transport for 1.A.3b category</i> <i>b. Accounting for HFC emissions from refrigerating and air conditioning under 2.F.1 category.</i> <i>c. Emissions from Manure management systems for 3.B.1 category</i> <i>d. Emissions from Enteric fermentation for 3.A.1 category</i> <i>e. The use of the land-use change matrix for LULUCF calculations</i> <i>f. Applying 2006 IPCC splicing techniques to modeling activity data for solid waste disposal (5.A.1 category)</i> <i>For each proposed theme, the following items of work are included:</i></p> <ul style="list-style-type: none"> ● Introduction on 2006 methodology for the selected category(s) ● Hands-on session: creating a step-by-step instruction and a checklist on estimating emissions ● Hands-on session: estimating emissions from the selected categories) using appropriate tools 	<p>Mixed live and online attendance from all the 5 Central Asia countries 6 x 3-day training sessions The participants need to identify the key priority sectors and categories and prepare the relevant sets of activity data and EFs (if country-specific factors are available)</p>	<p>A short practical guide for emission estimation in the selected categories A checklist for emission estimation in the selected categories An example of estimation results</p>	<p>For each session: 9 h training + 27 h of preparation; Total: 216 hours for 6 sessions</p>
<p>GHGI6</p>	<p>QA/QC system for the GHG inventory</p> <ul style="list-style-type: none"> ● Introduction on key requirements for the QA/QC system according to the 2006 IPCC GLs ● Hands-on exercise: identifying and documenting the QA/QC elements in the current GHG inventory using templates (for the 5 Central Asian countries) ● Plenary session 1: analysis of the documented QA/QC systems and identifying missing elements of QA/QC ● Working session: creating practical recommendations for improvement of the QA/QC systems 	<p>Mixed live and online attendance from all the 5 Central Asia countries 3-day training sessions The participants need to familiarize themselves with the current QA/QC inventory system implemented in their country</p>	<p>QA/QC system documentation Practical recommendations for improvement of the QA/QC system for the GHG inventory</p>	<p>9 h of training + 27 h of preparation; Total 36 hours</p>

GHGI7	<p>A refresher seminar on cross-sectoral analyses for the GHG inventory</p> <ul style="list-style-type: none"> ● Introduction on key requirements for the key category analysis according to the 2006 IPCC GLs ● Hands-on exercise: performing key category analysis using the KCA template tool ● Working session/assignment: creating practical instructional manual for performing Key Category analysis using 2006 IPCC Methodology ● Introduction on key requirements for the uncertainty analysis according to the 2006 IPCC GLs ● Hands-on exercise: performing uncertainty analysis using the excel template tool ● Working session/assignment: creating practical instructional manual for performing Uncertainty analysis using 2006 IPCC Methodology 	<p>Mixed live and online attendance from all the 5 Central Asia countries 1-2-day training sessions The participants need to familiarize themselves with the current uncertainty analysis method implemented in their country</p>	<p>Sample templates & step-by-step instruction manual in Russian for compilers on cross-sectoral analyses</p>	<p>6 h of training + 18 h for preparation; Total 24 hours</p>
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* Effort from the consortium, excluding travel

5.2 GHG projections

Training activities: GHG Projections					
Action code	The context	Method	Output	The effort required*	Links w/ Adaptation
GHGP1	<p>Main steps of developing near-term; mid-term and long-term GHG emission/sink scenarios in support of NDCs and LEDSS</p> <ul style="list-style-type: none"> · Storylines (visions of the future) · Drivers – Population, GDP, land-use, etc. (international and domestic sources) · Integrated approach (all GHGs and carbon sinks) · Models selection · Projection teams ● Scenario development and validation 	In class and on-line training	Session report	10 h of training (including QA/QC) + 30h preparation; Total 40 hours	Impacts/Adaptation assessment should be based on the same drivers and on regional climate projections (from IPCC AR6); Scenarios to take into account when assessing potential climate impacts
GHGP2	<p>Models and frameworks for scenarios</p> <ul style="list-style-type: none"> · GACMO · TIMES · LEAP · Regression analysis ● Carbon Budget Model 	Tool overview (presentation) Case analysis Practical hands-on session	Session report	40 h of training + 80 h of preparation; Total 120 hours	
GHGP3	<p>Regional topics</p> <ul style="list-style-type: none"> · Regional harmonization · Better matching projections with GHG inventories, focus on AFOLU · Sensitivity analysis ● NDC Progress Indicators 	Presentation and discussions on building regional cooperation mechanisms	Session report	16 h (presentations + discussion) + 48 h preparation; Total 64 hours	Regional harmonization is also applicable to adaptation topics

* Effort from the consortium, excluding travel

5.3 Mitigation policies and measures

Training activities: Climate policies and NDCs					
Action code	The context	Method	Output	The effort required*	Link w/ Adaptation
PAM1	Institutional arrangements	Exchanges with stakeholders from each country to define national schemes based on national circumstances	Specific national institutional schemes are developed based on questionnaires and discussions with stakeholders Guidelines explaining data to be tracked and reported under the ETF for P&M	80 hours over Approximately, 20 days per country Total: 400 hours	Design clear institutional arrangements that cover adaptation mainstreaming at multiple levels – including for monitoring and evaluation purposes; develop the regulatory framework (regulatory documents) accordingly
PAM2	Quantitative assessment of a sectoral policy GHG impacts using ICAT Toolbox (Policy assessment guides) Q&A sessions, workshops or webinars with trainers (the Consortium) to guide delivery of activities and outputs for the Activity Develop causal chains for each selected policy Identify with and without policy scenarios for evaluation of GHG and sustainable development impacts Identify the input data sets required for the policy assessment & data sources	Mixed live and online attendance from all the 5 Central Asia countries 2–3-day training sessions <u>per sector</u> Participants need to present 1-2 policies for analysis at the training session	Report on estimated GHG and sustainable development impacts of 1-2 policies, technical guidance on tracking policy impact indicators, Training and delivery support provided About 5-days per sector among Renewable energy, Agriculture, LULUCF, transport, GACMO, others	48 hours for preparation and training delivery 40 hours for report preparation x 5 sectors 100 hours x 5 sectors Total: 440 hours	
PAM3	Quantitative assessment of a sectoral policy sustainable development impacts using ICAT Toolbox (Policy assessment guides)	Mixed live and online attendance from all the 5	Report on estimated sustainable	48 hours for preparation and training delivery	Development of adaptation indicators consistent with SDGs (potential

	<p>Identify sustainable development indicators for assessment</p> <p>Quantify policy impacts on enteric fermentation emissions (quantification methods for enteric fermentation are available in ICAT guide)</p> <p>Qualitatively assess sustainable development (SD) impacts on the agriculture sector policies with evaluation of up to three sustainable development indicators</p> <p>Identify policy impact indicators and develop technical guidance for tracking them</p> <p>Disaggregate impacts by gender and/or considering explicitly in a policy assessment how a policy may disproportionately impact gender</p> <p>Draft report of methods, data used, and results of policy impact assessment</p>	<p>Central Asia countries</p> <p>2–3-day training sessions</p> <p>Participants need to present 1-2 policies for analysis at the training session</p>	<p>development impacts of 1-2 policies, technical guidance on tracking policy impact indicators,</p> <p>Training and delivery support provided</p>	<p>16 hours for follow-up supervision</p> <p>Total: 64 hours</p>	<p>contribution of CITEPA) – links with Recs 1 & 3</p>
PAM4	<p>Nationally Determined Contributions (NDCs) ICTU and Accounting</p> <p>NDCs – purpose, structure, requirements (the Katowice Climate Package and key elements of the ICTU guidance of decision 4/CMA.1)</p> <p>Identifying target areas</p> <p>NDC targets – setting up & monitoring specific indicators</p> <p>Exploring NDC toolbox</p> <p>Enhancing NDCs:</p> <p>Exercise using ICTU guidance and individual NDCs of the 5 CAREC States</p> <p>Case Study - interactive hands-on exercise</p> <p>Where to get help</p>	<p>Mixed live and online attendance from all the 5 Central Asia countries</p> <p>2–3-day training sessions</p> <p>The participants need to determine their focus for the training workshop (e.g., energy, cities, agriculture, etc.)</p>	<p>Session report & Recommendations on potential NDC enhancements and NDC tracking</p>	<p>48 hours for preparation and training delivery</p> <p>16 hours for follow-up supervision</p> <p>Total: 64 hours</p>	<p>Risk-informed NDCs (potential contribution of CITEPA) – links with Rec 5</p>
PAM5	<p>P&M NDC tracking tool</p>	<p>Mixed live and online attendance from all the 5 Central Asia countries</p> <p>2-day training sessions</p>	<p>Session report & Recommendations on quantification of NDC indicators for mitigation</p> <p>Table for format for data to be collected on a regular basis (for the BTR) (about 10 to 12 days to analyze national P&Ms and the training session)</p>	<p>32 hours for preparation and training delivery</p> <p>96 hours on reporting and analysis</p> <p>Total: 128 hours</p>	

PAM6	<p>Considering adaptation information in context of new/updated NDCs key elements of the decision 9/CMA.1 on the adaptation communication, including: UNFCCC arrangements for communicating and reporting on adaptation, how those arrangements relate, and what choices are available to Parties The function of adaptation components of NDCs as a channel for an adaptation communication; Case study (Nepal): how adaptation information was included in the INDCs/NDCs Group discussion: using outcomes from the adaptation training, we will work on quantification of adaptation indicators and discuss data sources for their monitoring and evaluation.</p>	<p>Mixed live and online attendance from all the 5 Central Asia countries 2-day training sessions</p>	<p>Session report & Recommendations on quantification of NDC indicators for adaptation</p>	<p>32 hours for preparation and training delivery 16 hours for follow-up supervision Total: 48 hours</p>	<p>Risk-informed NDCs (potential contribution of CITEPA) – links with Rec 5 Links with Output 2.2.1.1 (Briefing note on adaptation commitments (focus on national submissions on adaptation))</p>
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* Effort from the consortium, excluding travel

5.4 Adaptation

Training activities: climate change vulnerability and adaptation				
Action code	The context	Method	Output	The effort required*
AV1	Overview of adaptation commitments under the UNFCCC and the Paris Agreement, with particular reference to reporting under the Enhanced Transparency Framework	Documentation and analysis & review (academic and donors' documentation)	Briefing note on adaptation commitments (focus on national submissions on adaptation)	Total 4 hours
AV2	Identifying climate trends, projections and impacts in Central Asia, and key areas of concern	Documentation and analysis (international scientific projects e.g., CORDEX, national studies, donors' documentation)	Briefing note on climate change in Central Asia	Based on 2021 World's Bank Climate Profiles / with update if relevant 4h per country + 4h regional scale; Total 24 hours
AV3	Overview of monitoring & evaluation (M&E) adaptation practices: conceptual background, presentation of key methodological benchmarks including the IPCC AR 5 methodological framework, and the GIZ's approach to vulnerability assessments, examples and good practices / lessons to draw	Documentation of an analysis & review (academic and donors' documentation)	Briefing note on adaptation M&E (focus on national M&E systems)	Total 16 hours
AV4	Identifying national adaptation indicators at sectoral level, in particular for agriculture, food security, water resources, biodiversity, human settlements (e.g., air pollution & smog)	Documentation and analysis & review (official countries' submissions, e.g., to Sendai framework and to UNCCD on drought academic and donors' documentation)	Preliminary overview of priority adaptation indicators for each country	May be very time consuming, depending if national consultants can take the lead to collect data – based on recommendations from international consultants (templates ...) Approx. 16 h per country Total 48 hours
AV5	Design clear institutional arrangements that cover adaptation mainstreaming at multiple levels – including for monitoring and evaluation purposes; develop the regulatory framework (regulatory documents) accordingly	Discussion during the inception workshop? (linked to on-going NAP processes)		TBC

* Effort from the consortium), excluding travel

5.5 Climate finance

Action code	The context	Method	Output	The effort required*
CF1	<p>Training module on how ICAT tools and methodologies can be used in the context of climate finance. This can include the following purposes:</p> <ul style="list-style-type: none"> Defining the climate rationale of a project, using projections Defining project baselines Measuring the impacts of climate policies Building indicators and data collection protocols for constructing robust monitoring and evaluation frameworks for climate change projects Assessing SDG benefits of climate change mitigation and adaptation projects 	<p>Training-of-trainers; Hybrid format with attendance of international experts via virtual meeting software</p>	<p>ReCATH Centre regional experts are trained in how to apply ICAT tools and methodologies in the context of climate finance.</p>	<p>1.5h x 4 webinar-style deliveries 1.5 x 4 Q&A and assignment guidance 9 x 5 hours of preparation & materials 16 hours for follow-up guidance and feedback on deliverable; Total 73 hours</p>
CF2	<p>Training module on the ICAT methodology for tracking climate finance (forthcoming)</p>	<p>Training-of-trainers Hybrid format with attendance of international experts via virtual meeting software</p>	<p>ReCATH Centre regional experts are trained in how to apply the ICAT methodology for tracking climate finance and are thus equipped to support hub countries that would like to strengthen their MRV of climate finance systems</p>	<p>4 x 1.5 hours webinar-style delivery; 2 hours Q&A session; 24 hours preparation: Total 32 hours</p>
CF3	<p>Establishment of peer-to-peer learning format for climate finance</p>	<p>Virtual learning space providing a forum for exchange and collaboration among hub countries</p>	<p>Identify climate finance champions in the hub countries that offer sharing expertise on selected topics (e.g. Kazakhstan on green taxonomy, Kyrgyz Republic on costing NDC actions and measures, Tajikistan on tracking climate finance flows etc.)</p>	<p>2h x 5 webinar moderations; 5 x 6 hours of preparation and identifying thematic sessions and presenters; Total 40 hours</p>

* Effort from the consortium), excluding travel