

# Climate-Sensitive Water Resource Management and Climate Resilient Economic Modelling in Mongolia

## Context

Mongolia is highly vulnerable to climate change and is already experiencing significant impacts of warming around 2°C. For Eastern Central Asia and Eastern Siberia, including Mongolia, there is high confidence in a temperature increase of 5°C or more by the 2090s. The country is likely to experience increased water scarcity and depletion, as well as greater variability in precipitation patterns and increased frequency of extreme weather events. Furthermore, climate change related impacts in form of water scarcity, droughts, dzuds, and floods will further increase leading to higher economic damages, loss of ecosystems and vegetation decline. Currently some of these challenges are not properly considered in policy making, as the current land-use management is not sufficiently addressing ecosystem dynamics and joint considerations of climate and economy. Therefore, the provision of services is threatened, notably the provision of water with potentially severe implications for agriculture, livestock, and other socio-economic objectives. In addition to overuse of natural resources, climate change also puts severe pressure on eco-systems, increasing the risk of further deterioration towards patterns with highly reduced ecosystem functions and services for a broad range of economic activities and human wellbeing.

Mongolia must prepare to adapt to impacts of climate change not only on agriculture and animal husbandry which depend heavily on water and vegetation resources but also on other economic sectors such as energy, forestry, tourism, and infrastructure. Abundance of livestock contributes to an immense overgrazing and has critical impact on the aquatic ecosystem, causing a vegetational regime shift which ultimately can lead to ecological collapse. It is necessary to strengthen the integrated management of water resources in the river catchment areas such as the Tuul River e.g., by focusing on climate-sensitive and ecosystem parameters. Moreover, more economic aspects can be taken into account with the help of macroeconomic models that allow the assessment of climate adaptation measures and their effects on key economic indicators such as GDP, labour, and trade. Macro-economic modelling can raise the ambition for climate action taking economy wide socio-economic co- benefits at the centre of analysis. It allows policy assessment that aligns climate actions to optimum levels of economic, social and environmental objectives of the government via comparative scenario analysis. This contributes to a

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Countries	Georgia, Mongolia, Oman, Rwanda, Senegal, Uganda, and other selected countries
Overall term	03/2014 – 06/2025

paradigm shift regarding climate policy supporting a whole of government approach.



## Main Objective

In Mongolia, the DIAPOL-CE project aims to support the Ministry of Environment and Tourism of Mongolia (MET), Ministry of Economy and Development (MED), Bank of Mongolia (BOM) and its subordinated bodies, such as the Water Authority in enhancing climate resilience. The planned activities are twofold. On river basin level of Tuul River DIAPOL-CE shall contribute to the review-, update-, and development-process of the Integrated Water Resource Management Plan (IWRMP) while on the national level the project aims

to support policy making by providing technical capacities for Climate Resilient Economic Modelling. The coordination process was preceded by discussions and meetings on possible areas of cooperation.

## Approach

In December 2023, a new methodology to update IWRMP was adopted by the Minister of Environment and Tourism of Mongolia. DIAPOL-CE will support and provide guidance to the Mongolian Water Authority in transforming the IWRMP of the Tuul River Basin towards more climate-sensitivity. Spotlight will be geared towards catchment of Tuul River. DIAPOL-CE is aiming to enhance its partners' capacities to monitor and evaluate adaptation measures in water resources management. Climate change related impacts towards the Tuul River Basin shall be made visible and integrated in an adapted management model that encompasses climate-sensitive parameters, particularly linked to water and vegetation management. Through piloting at Tuul River Basin and applying the new methodology and existing data building on previous work, a climate-sensitive IWRM and ecosystem-based solutions for adaptation to climate change at river basin scale is supported.

Additionally, DIAPOL-CE supports the development of a macroeconomic model with integrated climate considerations, particularly adaptation to climate change through appropriate measures. The aim is to improve the analytical capacities for climate action in Mongolia through comprehensive economic analysis to support prioritization and planning of key mitigation and adaptation measures. Selected adaptation scenarios can be simulated in combination with defined climate risk scenarios and then analysed by a Cost-Benefit-Assessment. These results are subsequently integrated in the macroeconomic model to assess potential impacts on key economic indicators such as GDP, employment, income, or trade. This may also include the economic assessment of the above-mentioned measures related to the updated IWRMP. To ensure a sustainable use of the model and the consequent results, the activities are accompanied by frequent capacity development in the form of expert group meetings and trainings. Partners are trained to apply the model independently and through concomitant policy advice, the integration of results into policy making is facilitated.



## Expected Results

Macroeconomic modelling allows analysing the impact of selected and predefined climate adaptation scenarios policies on key economic indicators. Firstly, the CBA delivers conclusions on the economic viability of such adaptation scenarios by comparing the costs for implementing and ongoing expenses with the medium- and long-term benefits that are to be expected considering different climate change scenarios provided by the latest IPCC report. Secondly, the results are integrated into the model to provide insights on the effects of the adaptation policies on the whole economy. E.g., the broad introduction of irrigation systems could lead to higher input amidst decreasing precipitation, therefore leading to higher employment, less import, and higher GDP.

Besides the update process of the IWRMP of Tuul River Basin, DIAPOL-CE's water related activities also focus on vegetation management as key for a proper water management. The assessment of water and vegetation resources will be part of the IWRMP, namely as climate-sensitive parameters. Overall, the findings obtained can inform the political decision makers regarding economic and hydrological implications of the implementation of climate adaptation policies.

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