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# MONGOLIA: Assessment Report on Climate Change 2009



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### Mongolia Assessment Report on Climate Change 2009

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### **Executive Summary**

The Mongolia: Assessment Report on Climate Change 2009 (MARCC 2009) brings together the findings of climate change research in Mongolia for the first time, to raise awareness of decision makers and the general public so that they can develop appropriate responses to the challenges and threats.

Mongolia joined the rest of the world in addressing the issue of global climate change affecting its people and economy by affirming, among others, the United National Framework Convention on Climate Change (UNFCCC) in 1993 and its Kyoto Protocol in 1999. The Government of Mongolia has taken considerable steps toward the implementation of the UNFCCC, by accomplishing the required commitments such as the Initial National Communication (INC), Technology Needs Assessment (TNA) and the National Action Plan on Climate Change (NAPCC) to address climate change and other legal commitments.

The impacts of climate change on the ecological system and the natural resources are real and will dramatically affect almost all sectors of the national economy and human and animal life and therefore all aspects of the life support system. Therefore, climate change response measures should address the need to adapt to climate change and to mitigate greenhouse gases (GHG) emissions in order to meet the requirements of the sustainable development strategies of Mongolia. Climate change will directly influence achievement of the Millennium Development Goals (MDGs) of Mongolia.

In the case of Mongolia, its fragile ecosystems, pastoral animal husbandry and rainfed agriculture are extremely sensitive to climate change. As such, Mongolia's traditional economic sectors and its people's nomadic way of life are highly vulnerable to climate change. Mongolia is very sensitive to climate change due to its geographic location and socioeconomic condition. As a result of climate change and variability and the impacts of climate change, in the last forty years, Mongolian ecosystems have been notably altered. These changes have affected environment, desertification, water supply and natural disasters leading to financial, environmental and human losses.

The Government of Mongolia has established an interagency and intersectoral National Climate Committee (NCC) led by the Minister for Nature. Environment and Tourism to coordinate and guide national activities and measures aimed to adapt to climate change and to mitigate GHG emissions. The NCC approves the country's climate policies and programmes, evaluates projects and contributes to the guidance to these activities. It is directly responsible for implementing the commitments under the UNFCCC and Kvoto Protocol and for managing the nationwide activities to integrate all climate-change-related problems in various sectors. For operational requirements of the programme, a permanent Climate Change Office (CCO) is planned to be established under the supervision of the Chairman of the NCC. Mongolia has also started the preparation of the Second National Communication (SNC) to the UNFCCC which will be ready for submission early part of next vear.

In 2006, Mongolia's net GHG emission was 15,619 gigagrams (Gg) in CO<sub>2</sub>-equivalent. The energy sector (including stationary energy, transportation and fugitive emissions) was the largest source of GHG emissions comprising 65.4% (10.213.09 Gg) of total emissions. The second largest source of GHG emissions was the agricultural sector (41.4%). The total CO<sub>2</sub> removal was more than total CO<sub>2</sub> emissions at 2.082.6 Gg (13.3%) in 2006 due to an increase in the area of abandoned lands and a reduction in newly cultivated land. Other relatively minor sources currently include emissions from industrial processes and the waste sectors. As a whole, this translates to a CO<sub>2</sub> emissions per capita at 6 ton  $CO_2$  equivalent.

Among the energy sources, coal is the most important fuel in Mongolia. Its share in 2005 was 66.3%. Next was petroleum, which accounts for 22.7%. Share of hydro and other renewable energy was only 11%.

Based on the projections made during the preparation of the Initial National Communication by Mongolia regarding future emissions, by 2020 total emissions will rise by more than five (5) times over. Although Mongolia as a developing country has made no definitive commitments to reduce GHG emissions, the NAPCC aims to curb their growth.

The abatement scenario of emissions foresees the introduction and implementation of different options mainly focused on clean coal technology, energy saving through energy efficiency measures and promotion of renewable energy sources. Previous studies regarding the energy sector identified a number of mitigation options. For the energy supply sector, to increase renewable options such as hydropower plants, wind farms and PV and solar heating; to improve the efficiency of heating boilers and convert steam boilers into small capacity thermal power plants; to improve household stoves and furnaces: to improve coal quality by coal beneficiation and effective mining technology and to improve power plants efficiency. For the energy demand sector, the mitigation measures include: district heating and building environment; improve lighting efficiency; improve industry housekeeping and implement motor efficiency improvements and climate system, assessment of observed climate change, development of climate scenarios, vulnerability and risk assessment, potential impacts on ecosystems and society, and possible measures to adapt to climate change and mitigate the GHGs emissions at the national level. Based on such comprehensive studies and analyses, the NAPCC should be updated and hence facilitate the implementation of Mongolia's strategy and policy on climate change.

According to the records from 48 meteorological stations which are distributed evenly over the territory of Mongolia, the annual mean temperature of Mongolia increased by 2.14°Ñ during the last 70 years. However, annual mean temperature decreased in winter season for the period of 1990-2006. Since 1940, average summer temperature has been increasing noticeably. Precipitation changes in Mongolia can be classified by locations: since 1961 in the Altai mountain region, Altai Gobi and in the eastern part of the country has increased, and in all other regions has decreased by 0.1-2.0mm/year.

The future climate scenario for Mongolia projects changes such as increased air temperatures, increased precipitation amount in some areas and reduction of water resources and arable land. Potential evapotranspiration increase would be higher than precipitation amount increase. The most vulnerable areas in Mongolia are the agricultural, livestock, land use, water resources, energy, tourism and residential sectors. Future climate changes are

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