# MONGOLIA

## Intended Nationally Determined Contribution (INDC) Submission by Mongolia to the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP)

**Introduction**

Mongolia is fully committed to the UNFCCC negotiation process towards adopting at COP21 a legal instrument or an agreed outcome with legal force under the Convention, applicable to all Parties, in line with confining global warming below 2°C. Mongolia hereby communicates its intended nationally determined contribution to reiterate its determination to support the multilateral negotiation process and international community efforts in fulfilling the objectives of the UNFCCC.

**National context**

Mongolia is a landlocked country located in the centre of the Eurasian continent in a temperate climate zone. The climate is characterised by high fluctuations and extremes in temperature and precipitation. The annual mean temperature ranges from -8°C to 6°C across regions and the annual precipitation varies from 50 mm in the Gobi desert to 400 mm in the northern mountainous area. Climate change assessments undertaken in Mongolia in 2009 and 2014, demonstrated that fragile ecosystems, a reliance on pastoral animal husbandry and rain-fed agriculture, and the growing population with a tendency of urbanization, all combine to make Mongolia's socio-economic development vulnerable to climate change.

**Development of Mongolia's INDC**

Mongolia's INDC has its conceptual roots in the Green Development Policy of Mongolia, approved by the Parliament in 2014, to which key sectorial action plans at the national level, including energy sector, are being adjusted. Key indicators for measuring progress in the implementation of the Green Development Policy include, among others, efficient use of energy, GHG emissions and ecological footprint per unit of GDP. The National Action Programme on Climate Change (NAPCC) endorsed by the Parliament 2011 includes concrete measures in response to climate change covering all principal sectors of economy. These and other relevant national level policy documents served as a basis for the development of Mongolia's INDC, which was shaped and finalized through comprehensive consultation exercises with a broad range of stakeholders.

**Mitigation contribution**

In its INDC, Mongolia has outlined a series of policies and measures that the country commits to implement up to 2030, in the energy, industry, agriculture and waste sectors. The expected mitigation impact of these policies and measures will be a 14% reduction in total national GHG emissions excluding Land use, land use change and forestry (LULUCF) by 2030, compared to the projected emissions under a business as usual scenario. Those and other potentially more ambitious commitments are contingent upon gaining access to new technologies and sources of finance through internationally agreed mechanisms and instruments under the auspices of the UNFCCC (see Annex A).

**Adaptation component**

The melting of permafrost and glaciers, surface water shortages, and soil and pasture degradation have been identified as particular challenges faced by Mongolia as a result of climate change. Due to a high degree of vulnerability to climate change, adaptation is particularly important for Mongolia, and as such a distinct adaptation component is therefore included in the INDC. The selection of priorities for the adaptation component is based on a detailed analysis of the expected impacts, potential solutions and challenges, and of possible synergies between adaptation and mitigation activities (see Annex B).

| Annex A: Mitigation contribution | | |
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| **1. Timeframe** | | |
|---|---|---|

Up to 2030

| **2. Type of contribution** | | |
|---|---|---|

Policies and measures

| **3. Target level** | | |
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*3a. National contribution*

By 2030, Mongolia intends to contribute to global efforts to mitigate GHG emissions by implementing the policies and measures listed in Table 1, contingent upon the continuation of international support to complement domestic efforts.

*Table 1.* Policies and measures for implementation up to 2030

| Sector | Measure | Policy/strategy document |
|---|---|---|
| Energy (power and heat) | Increase renewable electricity capacity from 7.62% in 2014 to 20% by 2020 and to 30% by 2030 as a share of total electricity generation capacity. | State policy on energy (Parliament resolution No. 63, 2015), Green development policy, 2014 |
| | Reduce electricity transmission losses from 13.7% in 2014 to 10.8% by 2020 and to 7.8% by 2030. | |
| | Reduce building heat loss by 20% by 2020 and by 40% by 2030, compared to 2014 levels. | |
| | Reduce internal energy use of Combined Heat and Power plants (improved plant efficiency) from 14.4% in 2014 to 11.2% by 2020 and 9.14% by 2030. | |
| | Implement advanced technology in energy production such as super critical pressure coal combustion technology by 2030. | |
| Energy (Transport) | Improve national paved road network. Upgrading/Paving 8000 km by 2016, 11000 km by 2021. | National Action Programme on Climate Change (NAPCC), 2011; Urban public transport investment programme, 2015; Nationally Appropriate Mitigation Actions (NAMAs), 2010; Mid-term new development programme, 2010 |
| | Improve Ulaanbaatar city road network to decrease all traffic by 30-40% by 2023. | |
| | Increase the share of private hybrid road vehicles from approximately 6.5% in 2014 to approximately 13% by 2030. | |
| | Shift from liquid fuel to LPG for vehicles in Ulaanbaatar and *aimag* (province) centres by improving taxation and environmental fee system. | |
| | Improve enforcement mechanism of standards for road vehicles and non-road based transport. | |
| Industrial sector | Reduce emissions in the cement industry through upgrading the processing technology from wet- to dry- processing and through the construction of a new cement plant with dry processing up to 2030. | NAMAs, 2010; NAPCC, 2011; Government resolution No. 171, 2012: Building materials programme |
| Agriculture | Maintain livestock population at appropriate levels according to the pasture carrying capacity. | Mongolian national livestock programme, 2010 |

| 3b. Additional actions |
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Mongolia is also interested to pursue some additional mitigation actions:
- Reduce fuel use in individual households through improving stove efficiency (with co-benefit of air pollution reduction),
- Transport (development of a Bus Rapid Transit (BRT) system and improvement of the public transport system in Ulaanbaatar),
- Agriculture (development of a comprehensive plan for emission reductions in the livestock sub-sector for implementation between 2020 and 2030),
- Waste sector (development of a waste management plan, including recycling, waste-to-energy, and best management practices),
- Industry (motor-efficiency and housekeeping improvements).

Furthermore, in the forestry sector, a programme is underway to develop a detailed inventory along with the identification of mitigation options. In future communications, Mongolia intends to include actions for mitigation in the forestry sector to reduce GHG emissions from deforestation and forest degradation by 2% by 2020 and 5% by 2030 (according to State policy on forest, 2015).

## 4. Sectors

The INDC of Mongolia includes proposed measures and additional actions for energy (including transport), industrial processes, agriculture and waste. Projected emissions by sector for 2010 and 2030 are shown in Figure 1.
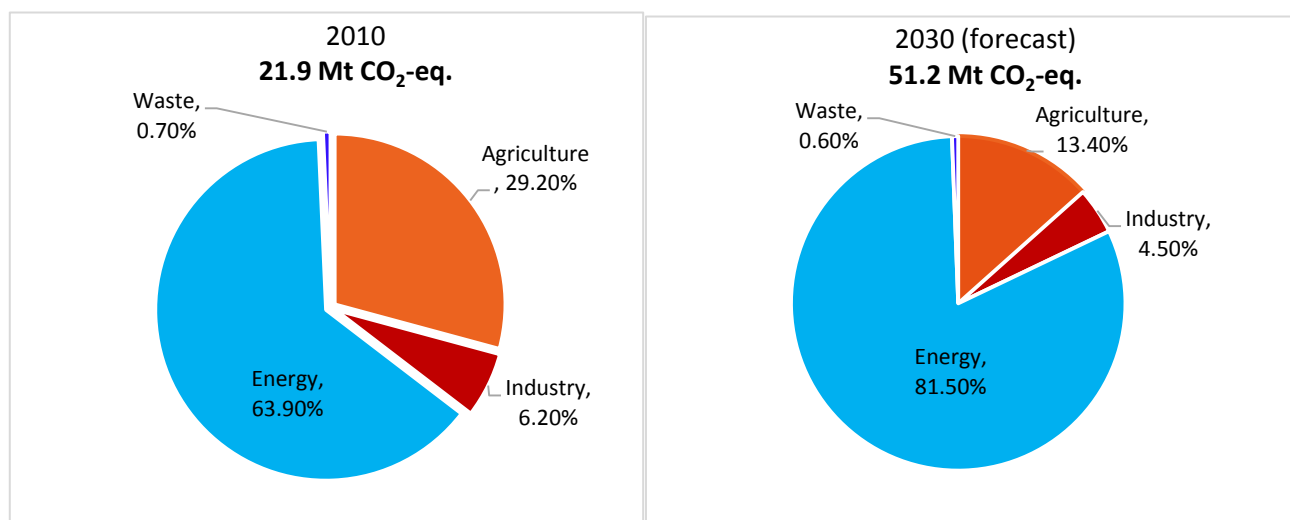


**2010**
**21.9 Mt $CO_2$-eq.**

Waste, 0.70%
Agriculture, 29.20%
Energy, 63.90%
Industry, 6.20%

**2030 (forecast)**
**51.2 Mt $CO_2$-eq.**

Waste, 0.60%
Agriculture, 13.40%
Industry, 4.50%
Energy, 81.50%

*Figure 1. GHG emissions share by sector in 2010 and 2030 [forecast, excluding LULUCF].[1]*

GHG emissions, reported here, exclude LULUCF sector, which are currently being estimated through the preparation of a national GHG inventory, within scope of the responsibility of the Ministry of Environment, Green Development and Tourism of Mongolia (MEGDT).

## 5. GHG emission reductions

In order to facilitate clarity, transparency and understanding, this section provides an indicative estimate of potential emission reductions for the measures targeting all major GHG gases ($CO_2$, $CH_4$, $N_2O$) in the sectors mentioned.

The cumulative impact of the measures listed in Table 1 is estimated to result in approximately an annual reduction of 7.3 Mt $CO_2$-eq. of economy-wide emissions in 2030, corresponding to a 14% reduction compared

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[1] The Ministry of Nature, Environment and Tourism (MNET), UNEP: Mongolia Second National Communication Under the United Nations Framework Convention on Climate Change, Ulaanbaatar, 2010

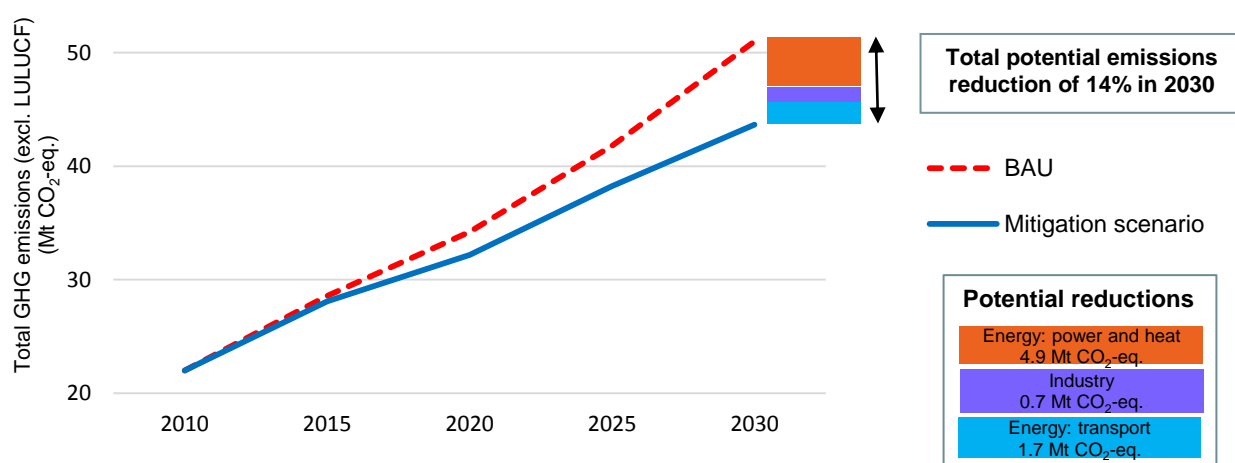to a business-as-usual (BAU) scenario, excluding LULUCF.



*Figure 2. Indicative potential emission reductions of the measures compared to BAU emissions*

## 6. Accounting methodologies

The latest official GHG emissions inventory was compiled for the year 2006 using the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, as described in Mongolia's Second National Communication (SNC). The projected emissions for 2010, as indicated in this document, were presented in the SNC. The BAU baseline was defined according to the methodology given in Mongolia's SNC.

Indicative emission reductions were determined using LEAP modelling (energy: power and heat; energy: transport) and Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (industry). A description of the methodology could be found in the INDC detailed report. The potential impact of agricultural emission reduction measures could not be estimated due to lack of available background information, and are thus not included in the indicative estimate. Actual and forecast emission reductions will be recalculated annually, based on improved data availability and appropriate adjustments to the BAU baseline's assumptions.

## 7. Fairness and ambition

Mongolia has a low responsibility for climate change mitigation in terms of its historic emissions, and limited capacity due to relatively challenging environmental conditions including a long lasting heating season, a coal based electricity production system, a lack of access to cleaner fossil fuels and a highly dispersed population particularly in remote areas (lack of access to the electricity grid). This has led to a high emissions per capita ratio. Mongolia is committed to the decarbonisation of its growing economy and intends to reduce its emissions intensity by implementing the proposed measures.

The proposed targets have their origins in the Green Development Policy of Mongolia, which is an over-arching and comprehensive approach to deliver low-carbon economic growth taking into account national circumstances in the context of its sustainable development. This ambitious strategy mainstreams both mitigation and adaptation in a way to reduce social and environmental vulnerability. Parliamentary approval of the most significant energy measures, and corresponding commitment to implement an important part of the mitigation actions with domestic means, demonstrates the ambition of the Mongolian Government.

## 8. Planning process and means of implementation

### *Planning Processes*

The Ministry of Environment, Green Development and Tourism is the key ministry to develop, update and implement climate related policies. In addition, other line ministries including the Ministry of Finance, Ministry

of Energy, Ministry of Industry, Ministry of Building and Urban Development, Ministry of Road and Transport and Ministry of Agriculture will be involved.

The elaboration of this INDC involved a multi-stakeholder process and consultations with key public bodies. It is largely based on existing legal frameworks and adopted policies of the Mongolian government, approved by the Parliament. Domestic legally-binding legislation already in place includes:

- Green development policy, 2014 (2014-2030)
- National Action Programme on Climate Change (NAPCC), 2011 (2011-2021)
- State policy on energy, 2015 (2015-2030)
- National agriculture development policy, 2010 (2010-2021)
- State policy on forest, 2015 (2016-2030)
- MDGs based comprehensive national development programme, 2008 (2008-2021)
- Law on renewable energy, 2015
- Law on energy, 2015
- State policy on Industry, 2015 (2015-2030)

Majority of the development and climate policies and programmes cover periods up to 2016 and 2020. Thus, during the period of 2016-2020, Mongolia will elaborate relevant policy documents for consultation at the national level for its development and national climate policies for the period 2021-2030. Progress towards the fulfilment of the contribution will be assessed through an annual review of the implementation progress of the proposed policies and measures.

*Means of implementation*

The measures outlined in this INDC have been presented as legislation and/or proposed in national development strategies and plans. As such, responsibility for implementation will follow existing institutional arrangements that define roles and responsibilities for the relevant sectors. In order to successfully implement the policies and measures as part of this contribution (Table 1), as well as the proposed additional measures (described in section 3b), Mongolia will seek international funding, capacity building and technology supports to complement its domestic resource allocations and efforts. Mongolia will articulate its specific needs, and communicate the potential supporting role of the international community. As a preliminary indication, some specific measures that will be important to reach the proposed targets are described in Table 2, with estimated investment needs of 3.5 billion USD. The anticipated financing modalities will be described at a later date, but a substantial private sector share is expected (leveraged by public funds) to be a part of the funding. Mongolia is interested in opportunities to access international climate funds namely the Green Climate Fund and in participation with crediting mechanisms to implement these measures.

*Table 2. Policies and measures for implementation up to 2030*

| Stated contribution | Specific measures | Investment needs | Source |
|---|---|---|---|
| Increase the share of renewable electricity capacity to 30% of total electricity generation capacity by 2030, from 7.62% in 2014. | Installation of 675 MW capacity large hydro power facilities. | 1,350 million USD | LEAP analysis with costs based on average of IPCC data[2] |
| | Installation of 354 MW wind power facilities. | 584 million USD | |
| | Installation of 145 MW solar PV power facilities. | 573 million USD | |
| Reduce building heat loss by 40% by 2030, compared to 2010 levels. | Improved insulation for existing panel apartment buildings of 18,184 households in Ulaanbaatar. | 90 million USD | Technology Needs Assessment (TNA), 2013 |
| Improved efficiency of coal fired heating plants and thermal power plants. | Improved efficiency of coal fired plants. | 900 million USD | TNA, 2013 |

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[2] https://www.ipcc.ch/pdf/special-reports/srren/SRREN_FD_SPM_final.pdf

**Annex B: Adaptation component**

**1. Rationale for Adaptation**

Considering the importance of adaptation to climate change in Mongolia, this adaptation component has been included in the INDC, due to its high degree of vulnerability to climate change. It is based on a detailed analysis of the anticipated impacts of climate change and those challenges would pose to socio-economic development. Adaptation targets have been identified, along with the funding, capacity, and technologies necessary to achieve them. Implementing these actions will support sustainable development and improve Mongolia's resilience to climate change. There is a need further to use more differentiated approaches such as defining the role of passive adaptation based on traditional ways of life, active adaptation based on gained knowledge and experiences, and proactive adaptation involving modern technology and know-how.

**2. Summary of climate change trends, impacts and vulnerabilities**

The annual mean air temperature over Mongolia has increased by 2.07°C from 1940 to 2014. The ten warmest years in the last 70 years have occurred since 1997. In this period, annual precipitation has decreased slightly and the seasonal rainfall pattern has changed: winter precipitation has gradually increased and summer rain has decreased in some regions. Climate projections show intensification of these changes in the first half of the 21$^{st}$ century. Some of the key impacts and vulnerabilities are:

- Approximately 70% of pastoral land has degraded, while changing plant composition.

- Winter *dzud* (heavy snow, cold waves, storms etc.) risk is likely to increase leading to more losses in livestock sector.

- Non-irrigated crop production is becoming more unstable. Assessments show that wheat production might be decreased by 15% by 2030 due to climate change.

- The drying up of lakes, rivers and springs and melting of glaciers has intensified in the last decades. The recent surface water resource inventory confirmed that 12% of rivers, 21% of lakes and 15% of springs have dried up. Water temperature and evaporation are continuously increasing, leading to declining water resources.

- The intensification of dry climatic conditions cause the increase of the frequency of forest and steppe fires, the occurrence and the intensity of forest insect and pest outbreaks. As a result, the forest area is reduced by 0.46% annually, and forest resources have been degraded significantly.

- The frequency of extreme weather phenomena has doubled in the last two decades. This is expected to increase by 23-60% by the middle of the century as compared to present conditions.

Assessment of current and future impact of climate change confirms that animal husbandry, arable farming, human health, and natural resources including water, forest, pasture and soil are the most vulnerable sectors in Mongolia, and also reinforces the importance of natural disaster management.

**3. Long and short-term adaptation visions, goals and targets**

*Vision for adaptation:* Increased adaptive capacity to overcome negative impacts of climate change, and to strengthen resilience of ecosystem and socio-economic sectors.

Adaptation aims to reduce risks and vulnerabilities for the following sectors:

- *Animal husbandry* aims to maintain ecosystem balance through improving pasture management.
- *Arable farming* aspires to meet the total national need in crops by reducing bare fallow and soil moisture loss, introducing medium and long-term varieties of crops, increased irrigation with water saving technologies including snow, and rain water harvesting.

- *Water resources sector's* objectives are to expand state protected areas covering especially river headwater areas, where 70% of water resources are formed, to ensure proper use of water resources, and to strengthen integrated water resource management in river basins.
- *Forest resource* aims to reduce forest degradation, and to implement re-forestation and sustainable forest management strategies.
- *Natural disaster management* seeks to build effective disaster management to prevent environmental and socio-economic losses.

Some adaptation activities under these goals will also have mitigation co-benefits:

- Improving pasture management would increase the carbon sink of $CO_2$ equivalent to 29 million tons per year, which is equal to 1/3 of emission reduction in energy sector.

- Reducing bare fallow to 30% in rain-fed crop land, increasing variety of crops, zero-tillage and crop rotation would consequently increase a carbon sink.

- Increasing protected areas up to 25-30% of the total territory will help maintain natural ecosystems and preserve water resources with a certain synergy effects for emission reduction.

- Increasing forest area up to 9.0% by 2030 and reducing forest fire affected area by 30% would conserve ecosystems and increase carbon sink.

In general, carbon sinks of natural ecosystems will be increased with a capacity to absorb almost a half of the $CO_2$ emissions from energy sector in the country by implementing adaptation policies in agriculture, forestry, and water resource sectors.

## 4. Current and planned adaptation undertakings

*Animal husbandry and pasture:* Every year, around 1.0 million USD is allocated from Government budget to facilitate scientific, environmentally sound measures against pasture insects and rodents. Monitoring system for pasture and soil has been created and is being strengthened.

Existing national policy documents include strategic objectives to protect pasture, which occupy about 80% of the territory. These objectives include improved pasture management, regulation of livestock numbers and herds' composition by matching with pasture carrying capacities, improved animal breeds, and regional development of intensified animal farming.

*Arable farming:* As of 2015, the total cropland has been accounted as 750 thousand ha and 450 thousand ha is re-used cropland, which was abandoned. Drip irrigation systems have been experimented since 1997 and currently used for limited area of vegetable field.

*Water resource:* As of 2015, state protected area covers 17.4% of the total national land including a certain part of river headwater areas. Integrated river basin management plans have been developed for 7 river basins out of the planned 29.

*Forestry:* Community based forest resource management has been introduced and about 20% of the forest area is currently under protection of community forestry groups, which comprise 74.8% of the total community groups on environmental protection. Multi-purpose forest resource inventory is under the process.

## 5. Gaps and barriers

Mongolia faces some challenges in mobilization of its full potential to achieve the adaptation goals and targets. Major barriers include:

- A lack of funding, financial incentives and investments.

- Challenges to introduce advanced new technologies and equipment due to lack of domestic

production.

- Weak management of disaster risks at local level, weak and inadequate early warning systems for prevention of droughts and *dzuds*, a lack of an enabling legal environment.

- Weak coordination and integration among various sectors.

- Insufficient human resources capacity and a lack of technical training on climate change and limited engagement of academic institutions.

- Weak monitoring and evaluation system for sectors, climate events and programmes.

## 6. Summary of adaptation needs

Based on current adaptation undertakings and gaps, the needs to achieve adaptation goals and targets for 2021-2030 are given in (Table 3).

Rough estimations of adaptation measures, listed in Table 3, shows that in the future Mongolia will need around 3.4 billion USD for funding in technology and capacity building. Up to 80% of total need expected to be financed from international sources and donor institutions.

*Table 3. Adaptation needs (2021-2030)*

| Sector | Adaptation goals | Adaptation Targets | Needs | | |
|---|---|---|---|---|---|
| | | | Capacity | Technology | Financial (international, investments), million USD |
| Animal husbandry and pastures | -To implement sustainable pasture management | -Reduce rate of pasture degradation -Regulate headcounts and types of animals including wild animals to match with pasture carrying capacities | -To create regulations for pasture use -To set up taxation system for pasture use -To increase community participation in proper use of pastures, their monitoring and conservation | -To build an early warning system for drought and *dzuds* to prevent animal loss -To improve livestock quality and breeds -To improve livestock health (epidemic and infectious diseases) management | 46.0 |
| Arable farming | -To increase irrigated cropland, reduce soil water loss and decrease soil carbon emissions | -To reduce bare fallow to 30% -To introduce crop rotation system with 3-4 routes and 3-5 crops -To expand irrigated cropland by 2-2.5 times | -To create regulations on soil protection (soil texture, nutrient and moisture) | -To diffuse zero-tillage technology -To increase variety of crops and rotation -To introduce effective drip irrigation technology reducing water use by 2.5-5.0 times | 150.0 |

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|---|---|---|---|---|---|
| Water resources | -To maintain availability of water resources through protection of runoff formation zones and their native ecosystems in river basins | -30 % of the territory will be state protected by 2030 and sustainable financial mechanism will be introduced | -To implement Integrated water resource management systems<br>-To coordinate multi-stakeholder relations through improved legal policies and efficient management<br>-To strengthen human resource capacity to deal with technical issues | -To implement ecosystem based technologies<br>-To support ecosystem services through hydrological monitoring, construction of water diversion canals to lakes located in flood plains and re-forestation actions | 5.0 |
| | -To construct reservoirs for glacier melt water harvesting<br><br>-To regulate river streams and flows | -To create water reservoirs at rivers and at outlets of lakes, and to construct multipurpose systems of water use | - To enhance hydrological monitoring and research for river flow regulation<br>-To construct water reservoirs and water diversion facilities to transfer water resources to dry regions | - | 1800.0 |
| | -To introduce water saving and water treatment technologies | -To find solutions (and subsequently implement) for sustainable water supply in Ulaanbaatar and for industries and mining in the Gobi region | - To conduct studies and introduce sustainable water supply with closed systems preventing evaporation loss | -To introduce new technologies for water saving, and treatment | 605.0 |
| Forest resource | -To increase efficiency of reforestation actions | -Forest area will be increased to 9% by 2030 through reforestation activities | -To build capacity of community forestry groups to conduct modern technologies for forest seedlings and tree plantations | -To introduce technology to plant seedlings | 11.0 |
| | -To reduce forest degradation rate | -To reduce forest degradation rate caused by human activities, fires, insects and diseases | -To set up fully equipped stations fighting forest fires and insects outburst and capacity building | -To use airplanes to fight against fires<br>-To introduce biological technologies against insects | 13.0 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | and pests | |
| | -To improve effectiveness of forest management | -To make forests resilient to climate change by improving their productivity and changing their composition and structure | -To provide equipment and machineries to carry out forest cleaning activities<br>-To train human resources for forest management practices | -To improve efficiency of forest cleaning technologies | 7.0 |
| Natural disaster management | -To enhance and improve early warning and prevention systems for natural disasters | -To strengthen early warning system for natural disasters | -To establish early detection and prediction system<br>-To conduct disaster risk assessments at local and sub-national levels | -To improve forecast quality through increasing super computer capacity<br>-To establish Doppler radar network covering entire territory of the country | 65.4 |

## 7. Monitoring and reporting process

Monitoring of climate change adaptation measures will be conducted in an integrated way as per the existing national programmes.

Required funding for adaptation measures, listed in Table 3, could be provided from State budget, Government special funds, international funds and through other financial mechanisms.

Monitoring will be based on achievement of adaptation goals and targets. Baselines and targets for indicators will be assessed quantitatively and qualitatively at every phase of its implementation.

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