SESSION 2: Country Presentations on Policy Innovations and Challenges in Response to Climate Risks

Mongolia: Policy frameworks, strategy development, governance issues in respond to climate change related risks

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Principal message from the climate change studies as basis for policy making:

- Present global warming in the long run would lead to the shift of climate zones with more dominance of arid and semi-arid areas in Mongolia.
- Vegetation zones will move to the north and semi desert and steppe zones will expand.
- Aboveground biomass will be diminished and pasture quality will be deteriorated.
GCM projections for the 21st century
(AIACC, MARCC):

- Dry and hot summer, milder but more snowy winter.
- Evapotranspiration is much higher than the projected slight increase in precipitation.
- The severity of extremes like drought might be doubled by 2080.
Projected impact on livestock

- The area unfavorable for animal grazing would increase from the current 40% to about 70% by 2050, and 80% by 2080.

- Animal mortality estimated to reach about 12% by 2020, 18–20% by 2050 and 40–60% by 2080.

- Decrease of animal productivity (based on projected decrease of the ewe weight of animals due to shortened grazing time because of heat stress).
<table>
<thead>
<tr>
<th>Year</th>
<th>Number of aimags affected</th>
<th>Loss of animals</th>
<th>Value of losses, Mill. Tugrik</th>
<th>Total loss, Mill. Tugrik</th>
<th>Costs for compensation, Mill. Tugrik</th>
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<tr>
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<td>Adult animals</td>
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The climate change study reports said that increased extremes resulting from climate change are significant barrier to livestock sector development and this impediment would grow significantly over the next 80 years.

NO FUTURE FOR PASTORALISM IN MONGOLIA?

- Researchers said: Pastoral nomadism in Mongolia is not out-of-date, but modern with its inherited resilience capacities

(Source: Fujita et al. Batjargal)
Publications on Mongolian ecosystem network
Lessons have to be learned by decision makers: to maintain interface with the scientific communities and listen to the voice of civil society groups.
Current nation’s development paradigm shift

Development paradigm based on:
- human capacity, including traditional way of life, enriched by modern science based knowledge and technologies
- or
- paradigm based only on: natural resources.
Dilemma for economic development

Economic development based:

- on renewable resources like pasture for grazing, nature beauty, solar radiation, wind, natural heat and cold, water, open space etc.,

- or

- on extractive mineral resources like coal, copper, gold and others
Mongolia, GDP growth rate

- Mongolia: 11.7%
- Kazakhstan: 6.0%
- Nepal: 3.8%
Stability of the mineral resource based economy of Mongolia (GDP) depends on the global economy fluctuation.
Because of a boom in the mining sector, Mongolia had high growth rates in 2007 and 2008 (9.9% and 8.9%, respectively). Due to the severe 2009–2010 winter, Mongolia lost 9.7 million animals, or 22% of total livestock and GDP dropped 1.6% in 2009. Growth began in 2010, with GDP increasing 25.3% over 2009 as Mongolia emerged from the economic crisis. GDP growth in 2012 has reached around 17%. However, inflation continued to erode GDP gains, with an average rate of 12%.

Unfortunately *not much* contributions so far for the *prosperity* of every one in this country from rapid GDP growth attributed to the mining boom.
Environmental Impacts of mining:
New challenges for the PBLH which operates, assuming that pasture and water sources are not polluted.

Land pollution and toxic chemicals issues

Waste–Rock Piles and Tailing Repositories. Rainfall washes gravel and soil down into valleys, where valuable grazing land can become polluted. In addition, acid mine drainage (AMD) is becoming a growing concern.

Mercury Pollution. Mercury was banned from gold mines but today it is used illegally in a few placer and hard-rock mines in Mongolia. Some other toxic chemicals also involved in mining operations.
Lower air quality from ASM is posing a growing health threat. Dust generated by placer ASM—by shoveling, scraping, chiseling, bagging, and spillages in a confined space with poor ventilation—causes eye injuries, bronchial complaints, and silicosis. Even more dangerous is the smoke from fires to melt permafrost, particularly black smoke from tires, which contains carbon particles, carbon monoxide, polyaromatic hydrocarbons, benzene, phenol, and cyanide.
Supposed impact of uranium mining in Mongolia (lamb with two heads as it was informed by Russian media recently)
An anticipated doubling of GDP over the next decade will potentially lead to degradation of both surface and ground water quality and quantity.

The economic growth will be driven by large-scale mining projects primarily in the water-scarce south Gobi region.

These activities will require large amounts of water for industrial operations (primarily from underground aquifers) and to meet the needs of new mining villages and settlements.
Intensive industrial use of ground water in the Gobi region will lead to diminish of ground water, accessible to local herders.
Green Development Policy

Principles

- Promotion of clean and advanced technology
- Sectorial policies and planning
- Efficient, effective and rational use of resources
- Ensure citizen’s participation in green growth
- Engrain environmentally friendly attitudes habits
- Transparent accountable and liable
Strategic objectives

Promote resource efficient, low greenhouse gas emission and waste less production and services.

Preserve ecosystem balance through intensification of environmental protection and restoration activities and reducing environmental pollution and degradation.

Introduction of financing, tax, lending and other optimal incentives for supporting green economy and increasing investments to promote environmental protection, human development and clean technologies.

Promotion of green employment, poverty reduction and engraining/promoting green life style.

Promotion of “Live in harmony with nature” living and culture values and make education, science and innovation as catalysts for green development.

Develop and implement population settlement plan in accordance with climate change, availability of natural and other resources in regions and restoration capacity.
Implementation measures and indicators

1. Promote resource efficient, low greenhouse gas emission and waste less production and services.

- Increase energy efficiency, renewing energy and other industrial technology an standard;
- Optimization of energy pricing policies;
- Green building rating system;
- Introduce energy audits;
- Development of industrial processing cluster;
- Improve agriculture product supply chains;
- Develop eco-tourism products and services that meet environmental and sanitation requirements;
- Create of Sovereign Wealth Fund using mining sector income.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2013</th>
<th>2020</th>
<th>2030</th>
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<tbody>
<tr>
<td>Share of renewable energy in total installed capacity of energy production</td>
<td>4.3%</td>
<td>20%</td>
<td>30%</td>
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<tr>
<td>Reduction of building heat loss, %</td>
<td>–</td>
<td>20%</td>
<td>40%</td>
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<tr>
<td>Agriculture processing industry share in GDP, %</td>
<td>22.5%</td>
<td>28%</td>
<td>30%</td>
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Opportunity-Natural resource and renewable resource

Mineral resource, biology resource
Establish green development models and norms in all economic and social sectors that are based on country circumstances, and a legal framework will be created to ensure green development progress, and infrastructure and redevelopment efforts that are aimed at enhancing long-term sustainable development will be actively mobilized.

A socially equitable, inclusive, and highly efficient green economy system is established where environmental sustainability has persisted, benefits from ecosystem services are accepted rationally, and adaptations to climate change are customized. The transition to a green economy will be recognized as high technology and innovative production prevailing in the economic structure, and the green economy will be established.
Efforts to reduce GHG emissions in order to limit global warming to below 2°C. Efforts must take into account the needs and capacities of each country.

Introduce new technology for fossil fuel GHG emission reduction by 2050.

Mobilization of 100 bln USD financing in Green Climate fund by 2020.

Sustainable development goals

17 goals 169 targeted indicators
For development of a climate change adaptation policy, the economic assessment of positive and negative climate change impacts and how this would in the future affect the environment and socio–economic development is yet to be conducted. The climate change adaptation concept can be understood as reducing possible future risks for the country’s vulnerable socio–economic sectors and building the foundation for green development that is well adapted to the environment.
Adaptation options to the changing climate with a minimum impact of the natural hazards, particularly zud events

- Passive adaptation (Дасан зохицох) based on the inherited (biological) and gained (life experience) resilience
- Active adaptation (Зохицон дасах) based on enhanced (scientific knowledge, education) resilience,
- Proactive adaptation (Идэвхтэй зохицон дасах) engineered resilience (communication, transportation means and facilities, infrastructure)
Animal husbandry

**Strategic goal:** To ensure food security, sustainable supply of raw materials for the food and light industries and to expand the production of clean and ecological products by developing an animal husbandry sector that is resilient and adapted to climate change.

- **Strategic objective 1.** Improve the management of animal husbandry production and increase the output, quality and productivity. The following measures are to be taken to achieve this objective:
Strategic objectives

- **Strategic objective 2.** Decrease vulnerability of pasture to climate change and improve its adaptive capacity: 20 measures

- **Strategic objective 3.** Produce nutritious forage appropriate for the productivity of pastoral and intensive animal husbandry and improve the food supply for people: 15 measures

- **Strategic objective 4.** Build capacity to overcome risks related to animal husbandry: 4 measures
The adaptation strategies and measures for certain vulnerable sectors

Arable farming

**Strategic goal:** Supply the domestic demand for food from arable farming sources and for livestock fodder by exploiting beneficial opportunities of climate change and mitigating risks that could arise from the negative impacts.

- **Strategic objective 1.** Explore possibilities to cultivate winter crops

- **Strategic objective 2.** Increase the soil moisture supply by retaining snow on the arable farming fields:

- **Strategic objective 3.** Exploit opportunities to cultivate crop sorts with medium to medium–late maturity periods and high yield:
Strategic objectives for arable farming

- **Strategic objective 4.** Sustainably use irrigable farm land resources for irrigated arable farming:

- **Strategic objective 5.** Protect and sustainably use water resources from glaciers and ice sheets:

- **Strategic objective 6.** Employ irrigation methods and technology that employ the least amount of water resources and labor for irrigated agriculture:

- **Strategic objective 7.** Introduce methods to increase moisture accumulation and to decrease evaporation in the non-irrigated arable farming:

- **Strategic objective 8.** Select and cultivate drought and heat resistant crop sorts:
The measures are to be taken to achieve this objective:

- establish and develop a legal and economic framework for promoting herder groups, communities, and cooperatives which are based on herders’ economic interests;
- establish and implement the legal framework for providing incentives to herders who are practicing climate compatible production;
- develop training programs to adapt production of herder families to climate change, and conduct local and distance training jointly with international and national projects and programs;
- supply herdors with suitable warm clothes in case of natural disasters and support national production of such products;
- improve the quality of livestock in selected regions by establishing breeding and trading farms of livestock with high productivity at aimag and soum level based on public–private partnership principles;
The measures are to be taken to achieve this objective (cont.):

- create policy framework for promoting the breeding of livestock with high productivity complying with pasture carrying capacity by providing incentives and taxes where appropriate;
- retain the weight of female reproducing stock at certain scientifically founded levels and maintain appropriate herd structure balance;
- promote intensive farming of productive stock close to highly populated urban areas and support the establishment/strengthening of such facilities and capacities by providing incentives such as credits with favorable conditions; and
- increase investment for, and strengthen the capacity of, professional facilities mandated to reduce risk of climate-related animal diseases.
The Mongolian Government adopted important policies to develop and introduce environmentally-friendly technologies. This includes the Law on Technology Transfer (1998), the National Comprehensive Policies based on the Millennium Development Goals (2008), the National Programme of Renewable Energy (2010), the National Programme of Climate Change (2011), and the Green Development Policy Concept (2014).

Advanced technologies are an important part of the successful implementation of the adaptation related policies. This assessment suggest options of the most important technologies, feasible to introduce to Mongolia in the immediate future to respond to climate change adapting to it all principal sector of the economy and livelihood of the local community as well as reducing the GHG emissions. Assessments of currently used technologies and its needs for each of the sectors are provided: Energy, Industry, Livestock, Land Use and Wastes.
Technology Needs Assessment project has just finished. Technology Needs Assessment Report describes key mitigation technologies in priority sectors for Mongolia such as large scale Hydro-power plants; Wind parks, Super critical coal fired power plants; energy efficient lighting; and improvement of insulation of panel apartment buildings.
Human Rights–Based Approaches (HRBA) provide a conceptual framework for development based on human rights standards as stipulated in international treaties and declarations.

These aim to promote and protect human rights by integrating the norms, standards and principles of the international human rights system into the plans, policies and processes of development.
Community-Based Adaptation (CBA) has been defined as, “a community-led process, based on communities’ priorities, needs, knowledge and capacities, which should empower people to plan for and cope with the impacts of climate change.”

It refers to an evolving yet distinct set of principles and practices that consistently target the most vulnerable populations and focus on activities with the greatest direct impact.
ecosystem-based adaptation (EBA) is a young concept. It has been defined as the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. Under this definition, EBA uses a range of opportunities for the sustainable management, conservation, and restoration of ecosystems to provide services that enable people to adapt to the impacts of climate change. It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. EBA focuses on maintaining ecosystem functions and services, it is an integral part of any broader strategy for human adaptation. EBA can be cost-effective and generate social, economic and cultural benefits, including disaster risk reduction, livelihood sustenance and food security, carbon sequestration and sustainable water management.
The pasture land, as a common pool natural resource, was customarily managed with free access for everyone within its administrative jurisdiction.

**Advantage:** there was no need for a costly governing structure, which might not be free from the possible management distortions and even certain elements of corruption.
Management tested by life: Round of year life circles for the Mongolian pastoralists within a given ecosystem service domain
Efficient use of land properties and landscape features for grazing, hay making and cropping (Western Mongolia)
Diversification of income sources in traditional way combining livestock breeding and crop cultivation.
Ecosystem based Adaptation Approach to Maintaining Water Security in Critical Water Catchments in Mongolia (Kharkhira-Turgen and Ulz rivers basin)

MON/12/301
Kharkhiraa–Turgen river sub-basin summer season
Ulz river basin
winter and summer season
Kharkhiraa–Turgen Basin area
Limited resources but non-limited opportunities if public participation is promoted on inclusive basis (Discussion with the soum governor about grass-root level activities)
Green House in Ulz river area
Diversified income source in addition to livestock products in Ulz river area.
(Strawberry cultivation: quite new business in this area)
Mongolia is one of the sparcely populated country in the world surviving the extreme continental climate condition with its high amplitude fluctuations of meteorological parameters, exercising most exposed to natural hazards life style based on pastoralism.

It could serve as a benchmark of response to internal social turbulences interfrened with external factors, like global warming and globalization.

Balanced vulnerability and inherited resilience capacity of all biological species, including human beings, could serve as a perfect example of response to external, but localized factors as the regional climate change and social circumstances associated with the change in the international political and economic regimes.

Traditional lifesustaining system in Mongolia was fully consistent with major principles of modern concept of the Green Economy.
Production involving renewable resources and consumption with fully recycling principles were a solid basis for the environmentally sound life sustaining system.

Conflicts, between the closed system as a living environment with limited capacity (pasture, for instance) and the open human system without forced limitation of the population size, have been resolved thanks to consistence of production and consumption patterns with natural cycles.

All mentioned above major principles can serve as a proper basis for development of adaptation options in response to the changing climate conditions, minimizing the negative impact of extreme natural events combined with the failures of social origin, which lead to the disasters like zud (severe winter weather hazard with economic damage and social impact) phenomenon.
Thank you for your kind attention!