SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS OF POLICY SCENARIOS IN MONGOLIA

Dawn Holland

Consultant to UNESCAP/Fellow, National Institute of Economic and Social Research

Building forward better: Securing inclusive, resilient and green development in Mongolia

21 February 2022, Mongolia (online)
POLICY SCENARIOS FOR MONGOLIA

- Joint research by Macroeconomic Policy and Analysis Section at ESCAP, UN country team for Mongolia, Development Policy and Planning Department of the Ministry of Economy and Development

- Applies ESCAP Macroeconomic Model, originally developed by ESCAP to support the design of economic recovery packages for countries in the Asia and Pacific region

- Model tailored to Mongolia’s economy, including a model of the livestock sector, which is linked to GHG emissions, pasture degradation and livestock productivity.
THE ESCAP MACROECONOMIC MODEL

- A complete global model:
  - 46 individual full country models for the Asia and Pacific region, including Mongolia
  - Smaller models of 9 key trading partners and 4 major regions

- Founded on a standard macroeconomic framework, with additional channels to capture key social and environmental variables
  - Structural econometric model
  - Designed primarily for scenario analysis rather than forecasting
  - Each country model has about 100 equations

- Can be applied to a wide range of policy questions plus stress testing and debt sustainability analysis
KEY ACTORS AND FEATURES OF THE MODEL

Households:  
- Consume  
- Save  
- Supply labour

Firms:  
- Produce output  
- Hire labour  
- Invest

Government:  
- Tax  
- Spend  
- Monetary policy

Poverty: Depends on income and post-tax inequality

Emissions: Depend on output, efficiency of production, the energy mix, livestock numbers, pasture degradation

Global linkages: Via trade, remittances, financial markets, emissions and energy markets
POLICY SCENARIOS

- A scenario is developed relative to a baseline set of assumptions.
- The scenario asks, “what if [some assumption] turns out different than assumed?”
- For example, new government spending programmes, an unexpected rise in oil price, a drop in world trade, etc...
- Results are generally viewed in terms of % difference from the baseline
SCENARIOS INCLUDED IN THE STUDY

**Reaching emission reduction targets**
1) Pricing carbon emissions
2) Investing in energy infrastructure
3) Improving livestock management

**Broadening export capacities**
1) Reducing reliance on coal exports
2) Investing in livestock supply chain infrastructure
SCENARIO 1: PRICING CARBON EMISSIONS

- Carbon tax is set
  - Decline in demand for fossil fuels and shift in energy mix
  - Fiscal revenue generated
  - Costs of production increase

- Energy input declines; potential output declines
- Global (pre-tax) price of fossil fuels decline
- Government budget balance improves
- Part of increase passes to consumer prices
- Remainder squeezes firm profits

- Fiscal space created
- Terms of trade effects
- Inflation rises, consumer spending declines
- Investment declines; potential output declines
SCENARIO 2a: INVESTING IN ENERGY INFRASTRUCTURE

Investment in clean burning stoves
- Fiscal balance deteriorates
- GDP rises
- Energy efficiency rises
- Energy consumption declines
- Air pollution declines
- Labour productivity rises
SCENARIO 2b: INVESTING IN ENERGY INFRASTRUCTURE

Investment in energy efficiency

- Energy consumption declines
- CO₂ emissions decline
- Output rises
- Air pollution declines
- Labour productivity rises
- Fiscal balance deteriorates

Energy consumption declines, CO₂ emissions decline, output rises, air pollution declines, labour productivity rises, and fiscal balance deteriorates.
SCENARIO 2c: INVESTING IN ENERGY INFRASTRUCTURE

- Investment in renewables
  - Output rises
  - Renewable energy consumption rises
  - Renewable share of consumption rises
  - Price of renewable energy declines
  - Renewable share of consumption rises
  - CO₂ emissions decline
  - Fiscal balance deteriorates
SCENARIO 3a: IMPROVE LIVESTOCK MANAGEMENT

Pasture restoration subsidy

- Pasture degradation declines
  - GHG emissions decline
  - Livestock productivity rises
- Livestock numbers decline
- Pasture degradation declines
- GHG emissions decline
- Real personal disposable incomes rise
- Household consumption rises
- Inequality and poverty decline
- Fiscal balance deteriorates
SCENARIO 3b: IMPROVE LIVESTOCK MANAGEMENT

- A virtuous circle can develop from intensive farming techniques and declines in pasture degradation

- Livestock productivity rises
  - Pasture degradation declines
  - Livestock numbers decline
SCENARIO 5: REDUCE RELIANCE ON COAL

- Global coal demand declines and renewable demand rises
  - Mongolia coal exports decline
    - Government revenue declines
    - GDP declines
  - Air pollution declines
    - Health improves and labour productivity rises
  - Global CO2 emissions decline
    - Capital depreciation rate declines
    - Potential output rises
- Global coal price declines
  - Government revenue of coal exporters declines
COMBINED POLICY SCENARIO

- Energy subsidies withdrawn over 5 years
- Carbon tax introduced – rising $5 per tonne for 5 years
- 50% of excess revenue channelled into social protection spending
- Investing in clean burning stoves: 0.1% of GDP for 10 years
- Investing in energy efficiency gains: 0.47% of GDP for 10 years
- Investing in renewables: 0.67% of GDP for 10 years
- Pasture restoration subsidy: Tg 5,500 per head of livestock
- Rise in livestock productivity of 25% over 10 years via intensive farming techniques
- 30% decline in global coal demand by 2030
- 10% decline in global price of coal by 2030
- Investment in livestock supply chain infrastructure: 0.9% of GDP for 10 years
COMBINED SCENARIO: IMPACT ON KEY VARIABLES

Impact on GDP (%)

Impact on Inflation rate (percentage point)

Impact on employment (%)

Impact on Government debt as % GDP

Impact on Household consumption (%)

Impact on Pollution (PM2.5) (%)

Impact on CO2 (%)

Impact on Poverty headcount ratio
COMBINED SCENARIO: IMPACT ON KEY VARIABLES
KEY TAKEAWAYS FROM SCENARIOS

- Taxing carbon will increase inflation temporarily, but has the potential to generate significant fiscal revenue that can be channelled into priority spending areas.
- Investment in clean energy infrastructure will support economic activity, accelerate progress towards emission reduction targets, and deliver health benefits that can raise labour productivity.
- Improving livestock management through pasture restoration and intensive farming techniques will support a decline in GHG emissions, raise livestock productivity and support economic activity.
- Channeling carbon tax revenue towards social protection can offset the costs of higher inflation on vulnerable households, support growth and reduce income inequality.
KEY TAKEAWAYS FROM SCENARIOS

- As the world progresses towards environmental targets, Mongolia is at risk of a significant loss in export revenue as demand for carbon-heavy fuels such as coal and petroleum decline.
- Declining global demand for coal will also bring long-term benefits to Mongolia, as the pace of climate change moderates.
- Increasing agricultural exports through a rise in livestock numbers will lead to more rapid pasture degradation, lower livestock productivity and increasing GHG emissions.
- Investing in livestock supply chain infrastructure while simultaneously encouraging a shift towards intensive farming techniques has the potential to raise incomes, reduce emissions, limit pasture degradation, reduce poverty and create jobs.
THANK YOU!
БАЯРЛАЛААА!