Transboundary air pollution in case of Mongolia

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Main sources of air pollution (1)

- **Residential**: Traditional gers and family house
- **Mobile**: Transportation
- **Thermal power plants**
- **Natural**: sand and dust storms, flooding, soil erosion, etc
- **Petrol stations**
- **Garbage dumps**
- **Other pollution source**

**AIR POLLUTION SOURCE**
Causing factors for formation of dust storms

1. Geographical position
2. Precipitation
3. Weather condition
   (cold front, strong wind)
4. Land cover
   - Soil
   - Vegetation
Monitoring network of dust storms in Mongolia

- 1936: Systematic observation were begun at 6 stations 4 times a day
- 1975: Observation time was changed 8 times a day
- 2004: Number of stations is 117

• Observation is implementing under the WMO observation programs
Mongolia Air quality network presently includes 11 urban and 24 rural sites across Mongolia
11 stationary stations in Ulaanbaatar city. (10 stationary & 1 mobile station)

- **Stationary**
  - UB-1 Khan-Uul district,
  - UB-7 Bayangol district

- **Road side**
  - UB-2 Bayangol district

- **Ger area**
  - UB-3 Songinokhairkhan district,
  - UB-5, UB-9 Svkhbaatar district
  - UB-11 Chingeltei district,

- **Urban area**
  - UB-4, UB-6 Bayanzvrkh district,
  - UB-10 Songinokhairkhan district

- **Background**
  - UB-8 Bayanzvrkh district

24 stationary stations in other large cities
The sources of dust storm

- Desertification caused by urbanization and within settlement areas
- Vegetation deterioration and therefore decrease of yield and species richness
- Illegal logging and clear cut of Saxaul forest areas in Gobi and deserted places
- Environmental impact from mining activities.
Observation methods for dust storms in Mongolia

- **visual** observation is used in Mongolia.
- Visibility and wind speed is main factor for visible observation of dust storms.
- Measurement of concentrations of dust particles in Ulaanbaatar from 1995 until now.
- Digital **video camera** observations at 3 sites from spring 2004 supported by the Kagoshima University, Japan.
- Observational data is used for international exchange and climate studies.
Direct affects and loses of dust storms

- **For livestock**
  - Domestic animals go along the wind direction and miss
  - They can be killed by sand storms

- **For agriculture**
  - Top particles of soil and grass can blow away

- **For housing**
  - Traditional houses and villages can become enshrouded with sands and broke

- **For transport**
  - Railway and roads can become enshrouded with sands
  - Due to reducing visibility
    - Regulation of aircraft flight can be changed and canceled
    - Auto transportation can be stopped and got with terrible
A village was enshrouded with sands

Photo: by Dash
Conclusion

To establish the network for concentration measurement of dust particles in the source areas

- Improve the monitoring system of dust storms, for example using remote sensing methods, LIDAR measurements, etc
- Develop a model for the prediction of dust storms
- Develop a model of the dust movement
Conclution

- Conduct study of trace gases and greenhouse gases near boundary region.
- To use air pollution transport modeling including chemical transformation for transboundary air pollution / for trace gases/
- To establish monitoring stations for complex study / air pollution and its physical and chemical properties/
- To compare results with investigation with Russia and China
- To develop special modeling for air quality of Mongolia / it will be include transport from Russia and China /
THANK YOU FOR YOUR ATTENTION