Transboundary air pollution in case of Mongolia

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Main sources of air pollution (1)

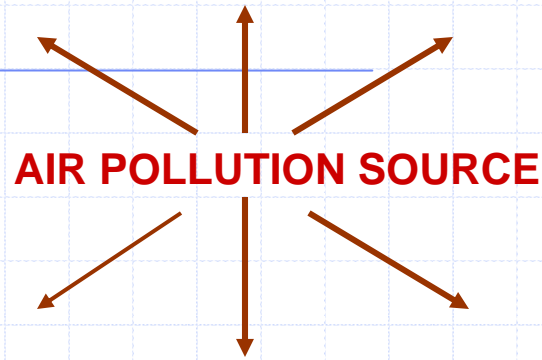Residential: Traditional gers and family house

Mobile : Transportation

Thermal power plants

AIR POLLUTION SOURCE

Natural : sand and dust storms, flooding, soil erosion, etc

Other pollution source
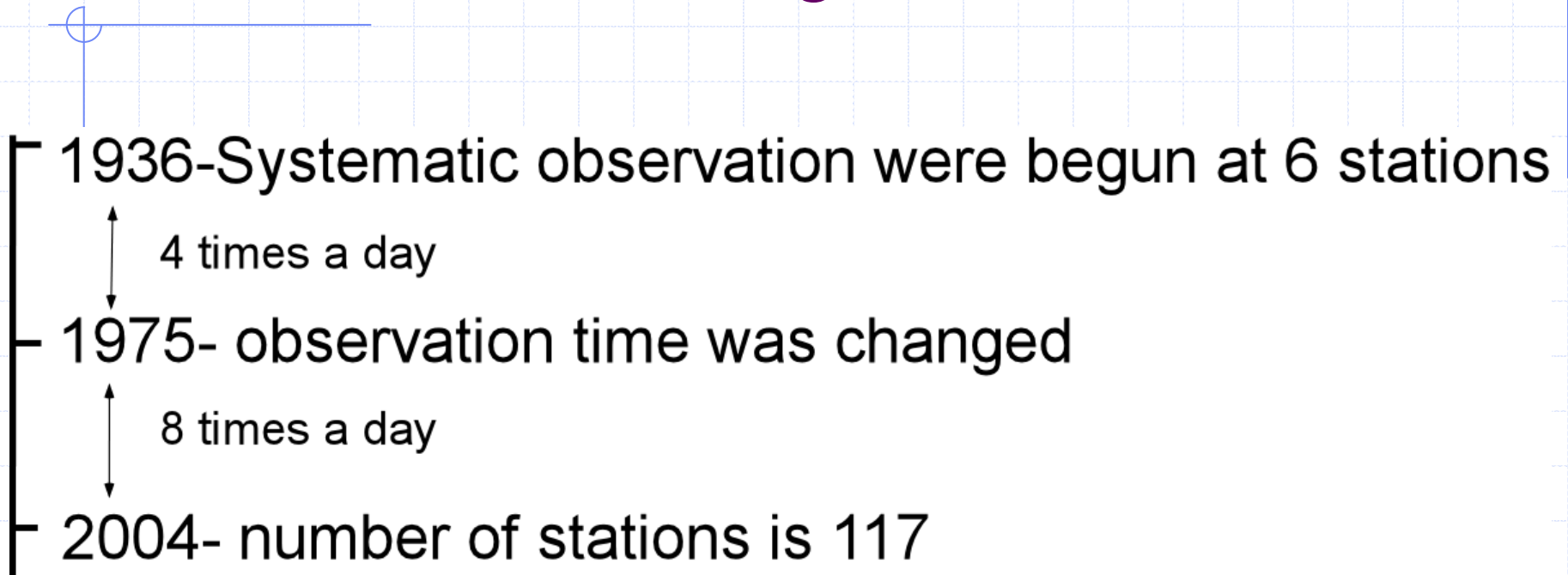
Petrol stations

Garbage dumps

Heat only boilers

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

Air quality monitoring stations (1)

Mongolia Air quality network presently includes 11 urban and 24 rural sites across Mongolia

Air quality monitoring stations (2)

Mobile station

Stationary station

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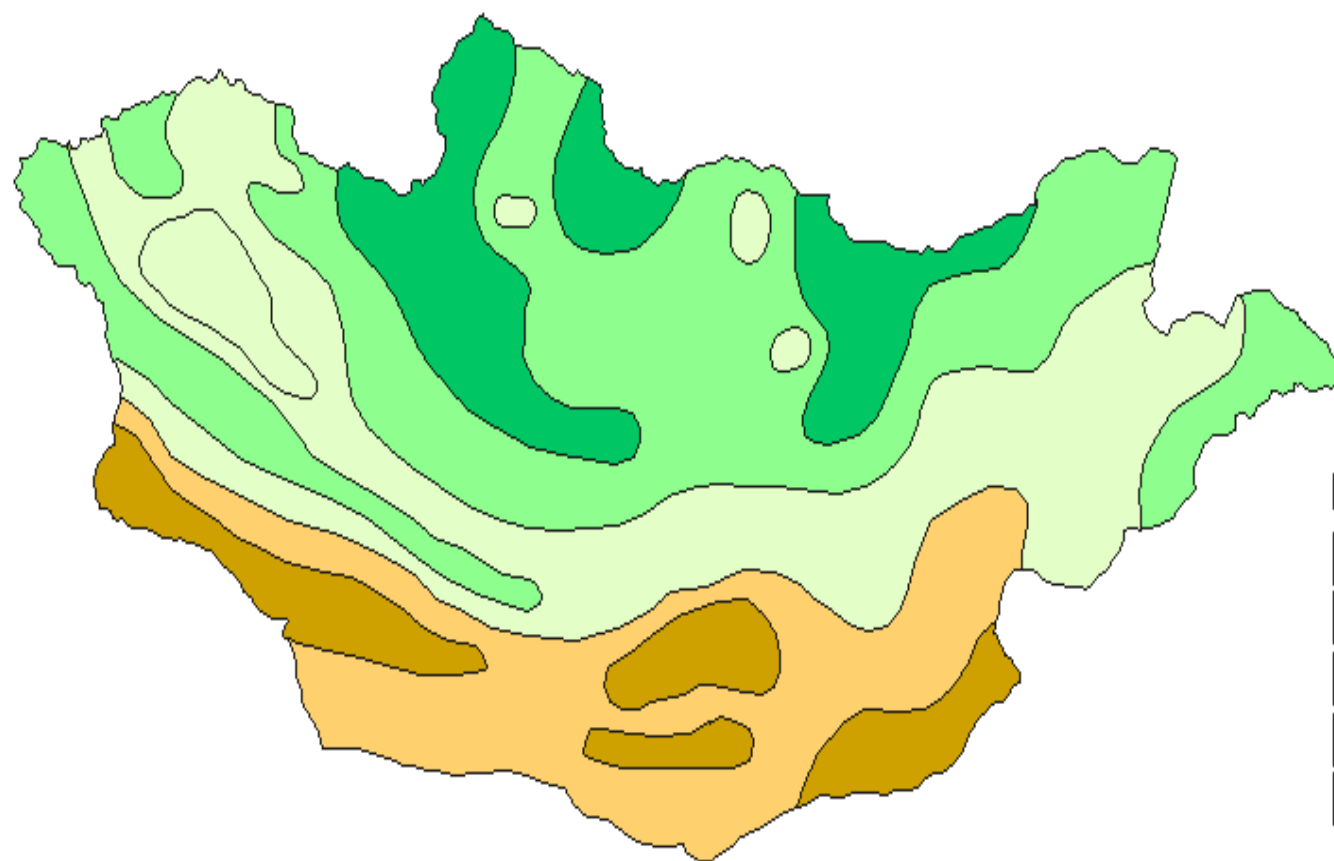
- **Background**
  UB-8 Bayanzvrkh district

➢ 24 stationary stations in other large cities

Legend
- < 5
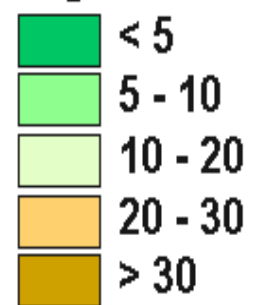- 5 - 10
- 10 - 20
- 20 - 30
- > 30

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 enshroud with sands and broke
- ◈ For transport
  - ▪ Railway and roads can become enshroud 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 transboundry 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