Local strategies to cope with climate variability and droughts in current agricultural practices in Kazakhstan

Valentina Idrissova (presenter), Irina Yesserkepova, Svetlana Dolgikh,
Kazakh Research Institute for Environment Monitoring and Climate,
Ervin Gossen, National Center of Agricultural Studies, Kazakhstan

Outline

- Natural and non-climate (anthropogenic) impacts on agricultural lands and pastures in Kazakhstan
- Local coping strategies and practices to cope with climate related risks in grasslands and grain production
- Steps to be undertaken to facilitate introduction of good coping practices throughout Kazakhstan
- Adjusting existing strategies to climate change

Traditional Activities and Climatic Factors

- Traditional livestock-breeding.
  - Grasslands – about 180 mln ha,

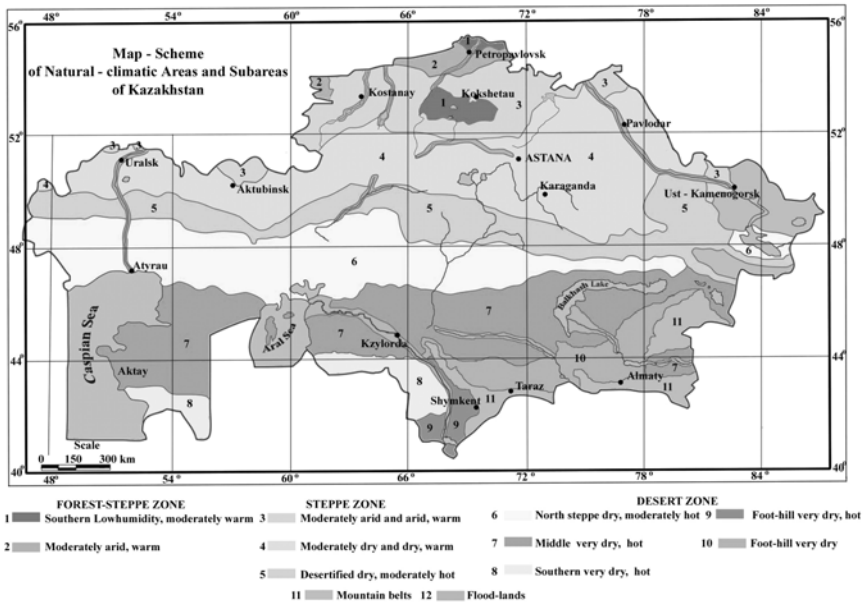
    Arid desert area (P/PET 0.05-0.2),

    Brown loamy soils
- Grain production (60s)
  - about 20 mln. ha,

    Arid and semi-arid steppe area (P/PET=0.2-0.45),

    Southern Chernozem soils

    Dark chestnut soils
- 24% of years - dry and 49% - semidry.



Non-climate Factors

- ✶Grasslands
- Traditional way of livestock-breeding (Distant-pasturing) disregarded:
  - Overpasturing
  - Overgrowing with shrubs (abandoned hayfields)
  - Loss of Biodiversity

✶Arable lands:

- no long-term traditional practices, extensive farming
- 20-30% of humus are lost
- Wind, water and irrigation erosion

Coping strategies and Practices Grasslands:

✶Learning from the past:

- Return to distant-pasturing
- Restoring infrastructure (wells, pinfolds)
- Traditional haymaking and pasturing regulation (time and place)

✶Introducing new practices/techniques:

- Vegetation inventory
- Planting of perennial species

Coping strategies and Practices Arable Lands:

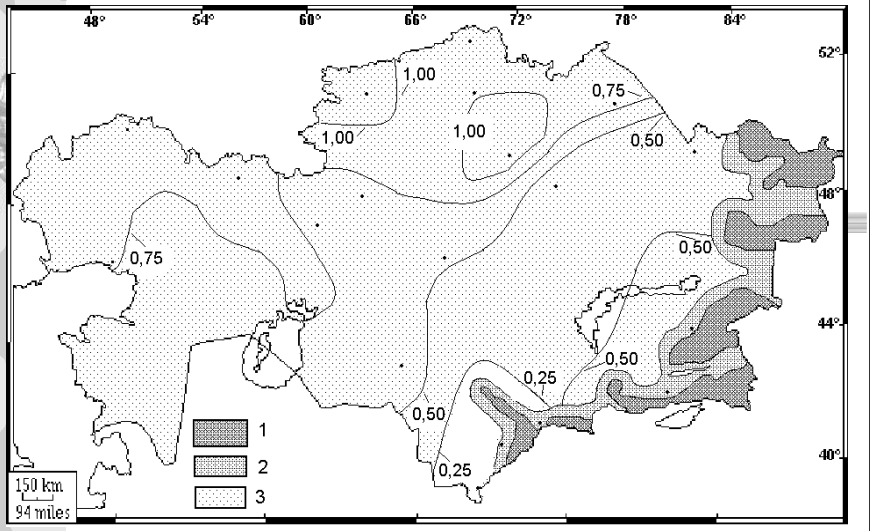
- Agroclimatic landscape zoning
  - (4 zones)
- Rejection of extensive farming/learning from existing practices at similar climatic zone
  - Restoring land fertility
  - Abandoning low-productive lands (converting into pastures)
  - Snow reserving
  - Apply new tillage practices

Economic and political measures to facilitate introduction of good coping practices

- Agricultural lands inventory (water sources, arable lands)
- Genetic grain funds by areas
- Infrastructure (technical maintenance service, processing and storage of grain)
- Long-term meteorological and pest forecasts at reduced charge
- Grain seeds reserves (insurance funds)
- Taxation and funding (loans)
- Land law

Changing climate conditions:observed

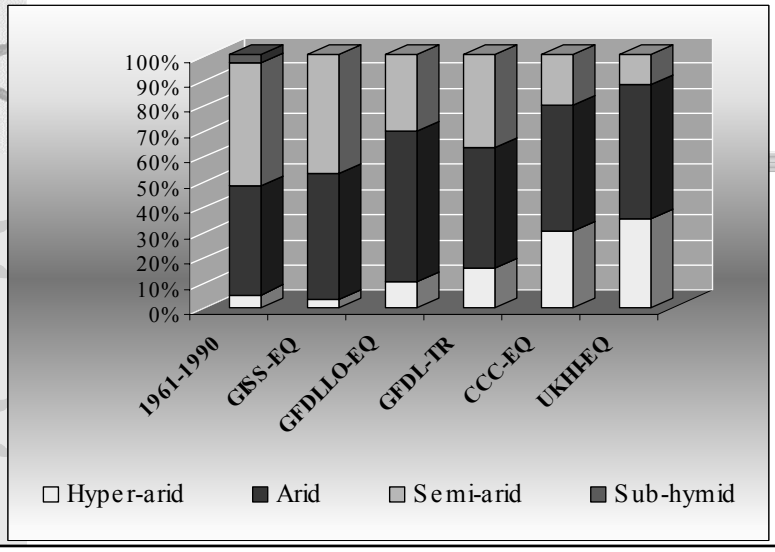
Differences in the annual temperature normals between 1931-1960 and 1961-1990, ºC



1 – mountain regions; 2 – foothills; 3 – areas where difference was estimated to be significant.

Changing climate conditions:scenarios

Distribution (%) of humidity zones for the 1961-1990 and simulated for 2061-2090 for Kazakhstan



Proposed adaptation to climate change

- Sustainability of existing coping strategies
- Planting midseason and middle late grain species
- Changing planting dates
- Switching from spring to winter grain crops

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