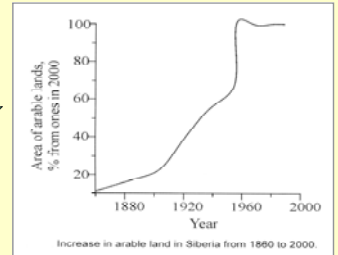


### Ecological and Economic Strategies for Sustainable Land Management in the Russian Steppes: A Potential Solution to Climate Change

#### Problem Statement:

- **Large-scale land-use/land cover change:** Reclamation activities (*rus. "Tselina" – the virgin land campaign*) in the Eurasian steppe belt (1954-1964): 420.000 km<sup>2</sup> new arable land



adapted from: Titlyanova et al. 2004



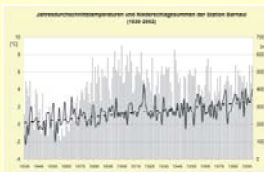
Climate Change: current state and tendency of changes

- Intensive and less or not sustainable agricultural land use at the last decades
- New conditions and factors for agricultural land use, after the break down of the Former Soviet Union
- Additional challenges due to the climate change
- Change of the property rights, the form and the intensity of land use

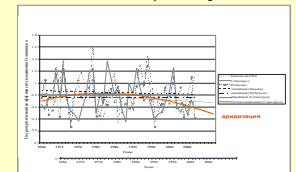


Agriculture equipment from the soviet time at „new fallow“ land

Annual average temperature and sum of precipitation in Barnaul station (1838 – 2002)



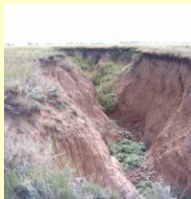
adapted from: Bergmann 2005



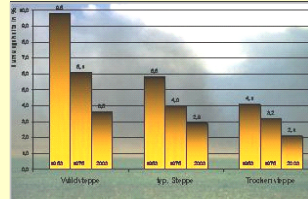
adapted from: Silantjeva & Charlamova 2011

#### Ecological and economic consequences and problems

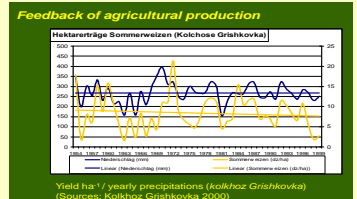
- In the virgin land regions degradation and desertification processes are widespread (60-70%) – especially in the South part of the ecosystem conversion region.
- The ecological situation of > 40% of arable land is critical. This led to a reduction of yield about 20-30% on arable land (after : Kiselnikov /Larina 1996)



Wind and Water erosion



Soil compaction and lost of humus (all pict./fig. adapted from Meinel, 2004)

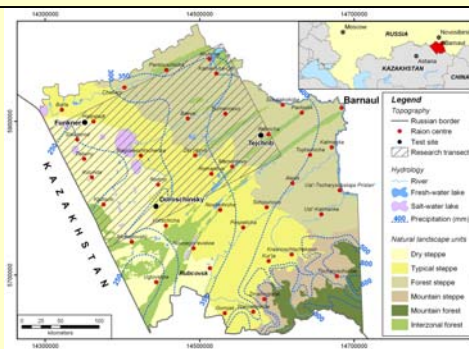


#### Research area:

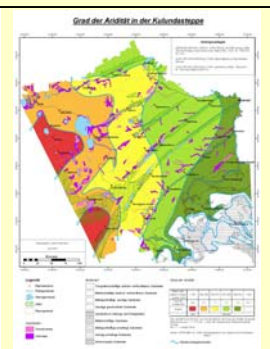
The South West Siberian KULUNDA-Steppe:  
 A typical part of the conversion region with characteristic landscape conditions and land use history



1954/1955: Conversion of 75 ...92 % of the steppes (Old fallow):  
**Growth of the cultivated arable land of 61% from 4,6 => 7,4 million ha**



adapted from: Meinel 2004



adapted from: Bergmann 2005

Funding Measure:  
 Project Director:

BMBF – Funding Measure “Sustainable Land Management” Module A  
 Prof. Dr. Dr. h. c. Manfred Frühauf (Martin-Luther–University Halle-Wittenberg, Faculty of Natural Sciences III, Institute for Geosciences and Geography).

Scientific Coordinator:

Dr. M. Kasarjyan (Martin-Luther–University Halle-Wittenberg, Faculty of Natural Sciences III, Institute for Geosciences and Geography).