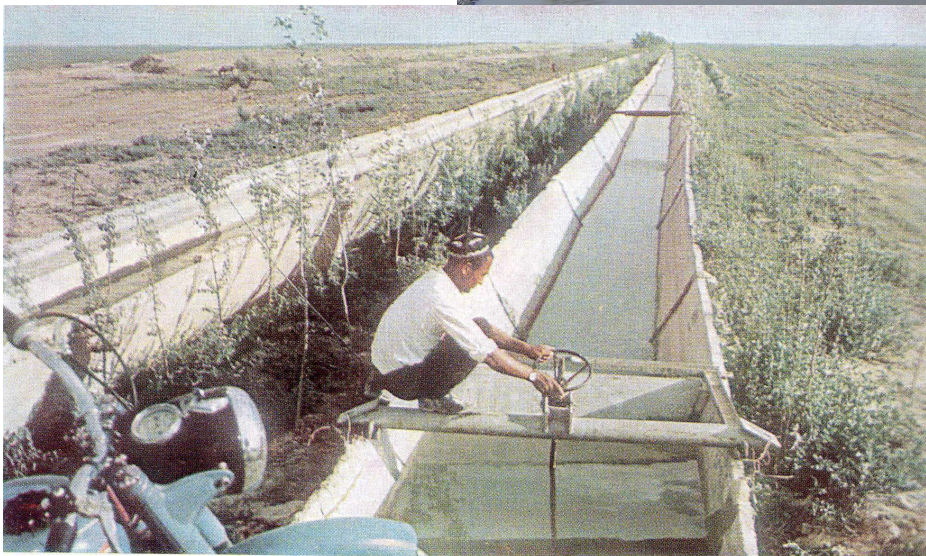


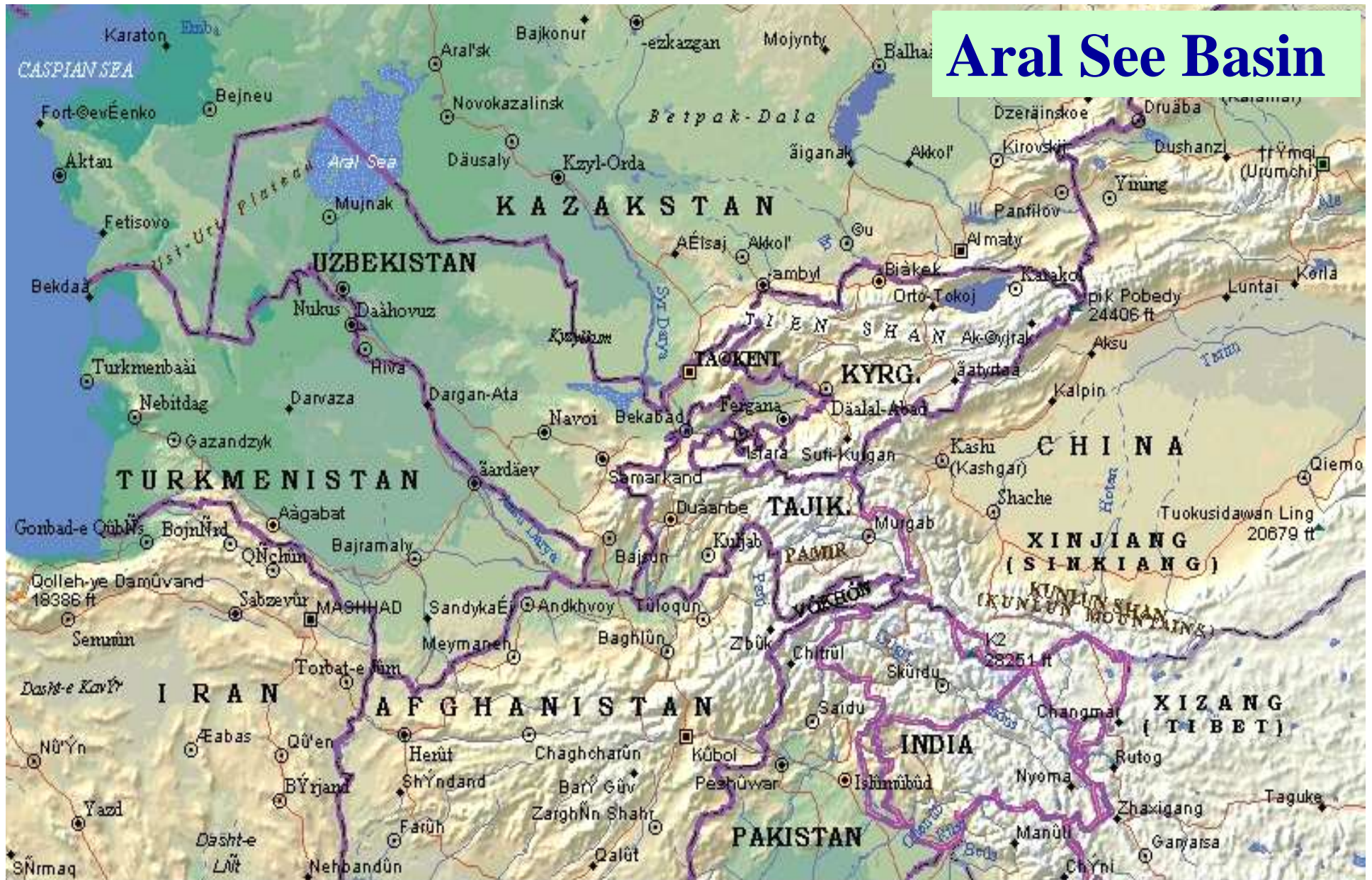
Assessment of Vulnerability on the Aral See Basin



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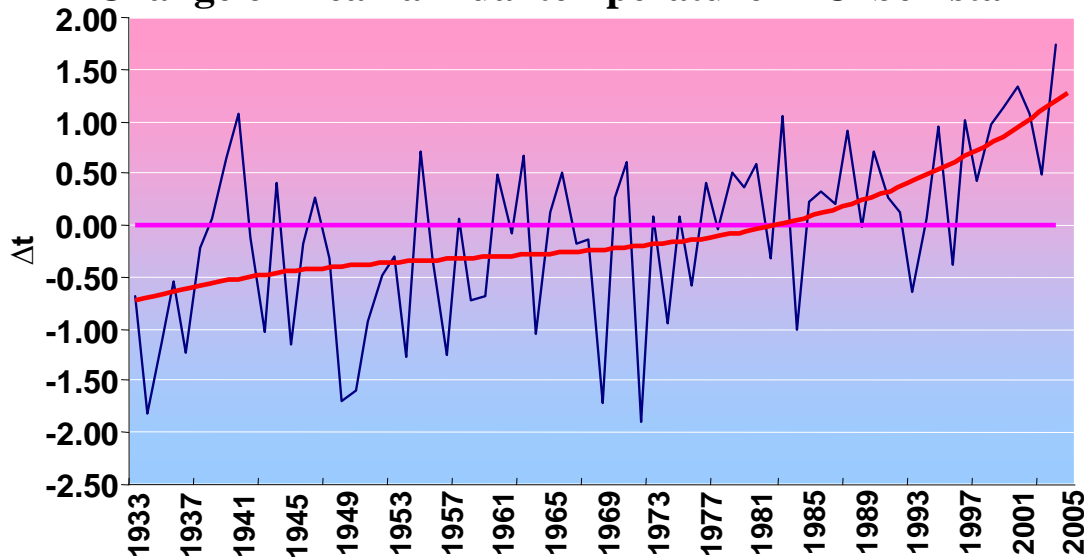
Aral Sea Basin



The river runoff is concentrated in two largest transboundary rivers: the Amudarya (78.5 km³ per year) and Syrdarya (37.1 km³ per year), which run down from the mountains to the plains, cross the deserts and flow into the Aral Sea

Climate change

Change of mean annual temperature in Uzbekistan

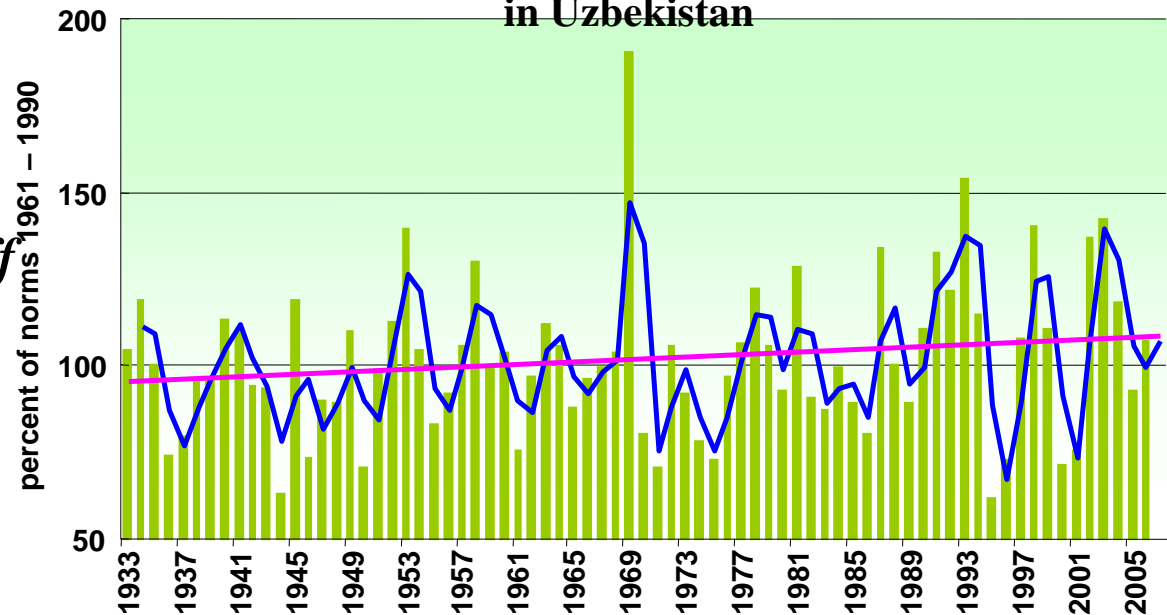


- *There is a tendency to increasing of the air temperature and changes in length of cold and hot year seasons for the Central Asia territory;*
- *Climate dryness becomes more severe.*

➤ *There are significant variations of precipitation under their slow tendency to increasing.*

➤ *Different reaction of runoff forming and runoff dissemination zones to the recent climate changes and anthropogenic impacts takes place.*

Change of annual sums of precipitation in Uzbekistan



Water resources

- *possible threat - increase in water resources deficit;*
- *decrease in snow reserves in the mountains;*
- *glaciers degradation, increase in contribution of glacier runoff to the rivers;*
- *increase in the number of glacier lakes (short-term prospect);*
- *decrease in river runoff as glaciers are melted (long-term prospect);*
- *population growth, increase in water demand stemmed from a higher living standard.*

Increase in fresh water resources deficit due to the current and expected climate change in the Aral Sea basin

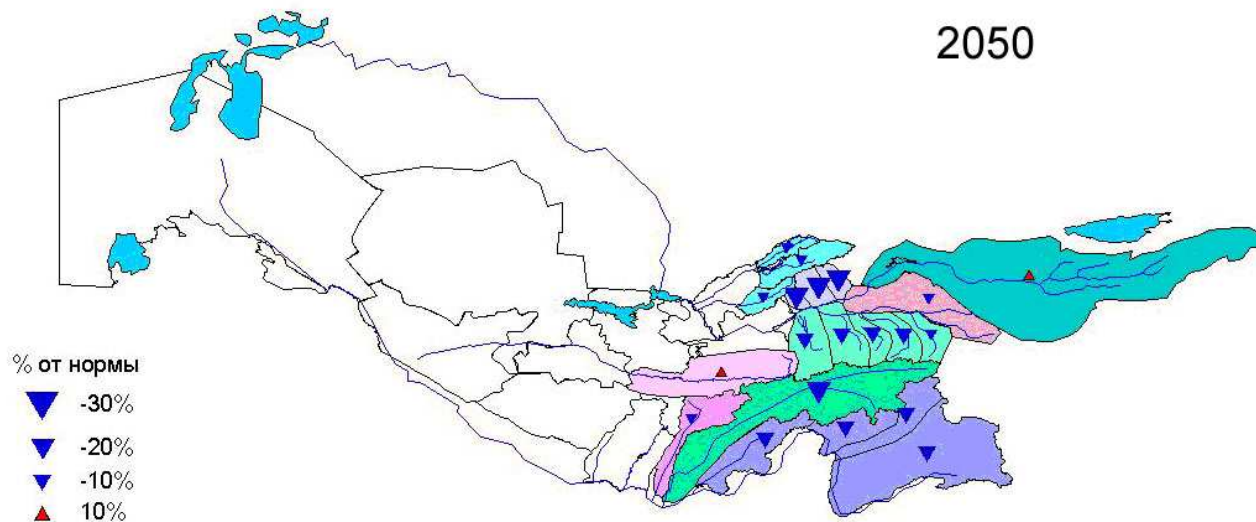
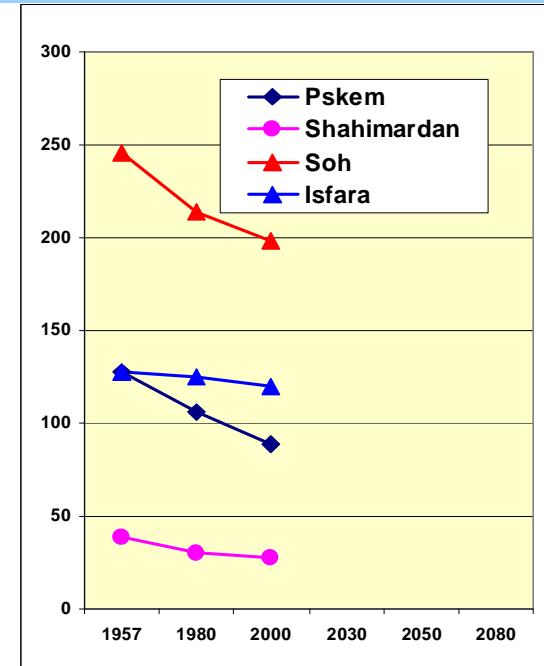


Water resources

Our assessments have shown:

There is a tendency to decreasing of the snow supplies;

- *Glaciers continue to be reduced at rates of 0,2 % - 1 % per year;*
- *Increase in evaporation in the river basins;*
- *Increase in variability of precipitation and intensification of all factors for the years with drought*
- *With the further increase of air temperatures the river runoff decreases.*

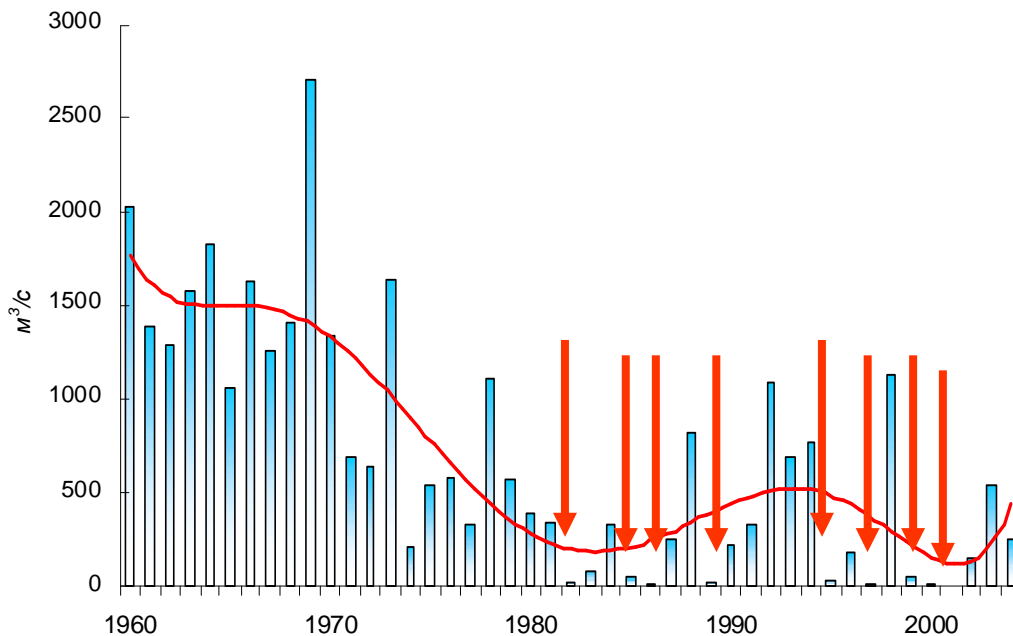


- *Rivers of the Amu Darya river basin and small rivers are more sensitive to climate warming*
- *It is expected that runoff variability of all basins will go up.*

Water resources

Our assessments have shown Increase in risk of water related hazardous phenomena:

- *increase in risk of glacier lakes break;*
- *possible increase in risk of drought;*
- *increase in mudflow danger and damage impaired by mudflows;*



- *Frequency of severe draughts in the Aral Sea area has increased*
- *During the draught years quality of the surface waters worsens according to mineralization and microbiological indices*
- *Adverse conditions are observed in the downstream during the years with hydrological droughts.*

Agricultural sector

Our assessments have shown:

Climate change impact on sustainable development of the agricultural sector associated with irrigated farming:

- ❖ *increase in irrigation rates;*
- ❖ *increase in salinity of irrigated lands;*
- ❖ *decrease in productivity of modern sorts of crops;*
- ❖ *strengthening of air draught and increase in extremely high temperatures occurrence.*
- ❖ *increase in repeatability of the dangerous meteorological phenomena (heavy precipitation in spring, hailstones), probability remains of crops exposure to frosts)*



Expected increase of evaporation under conditions of climate warming will increase water losses in the irrigated areas that entail increase in water demand there.

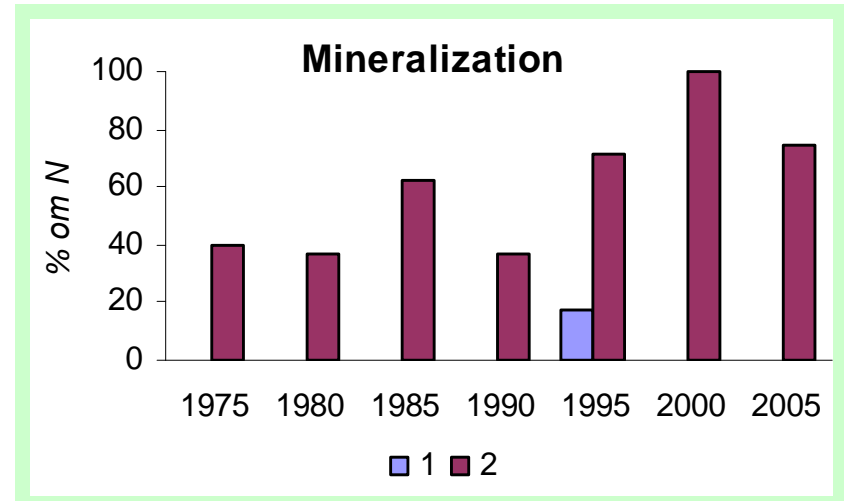
Climate change will increase water deficit for irrigation needs under current situation in irrigation.

Water quality

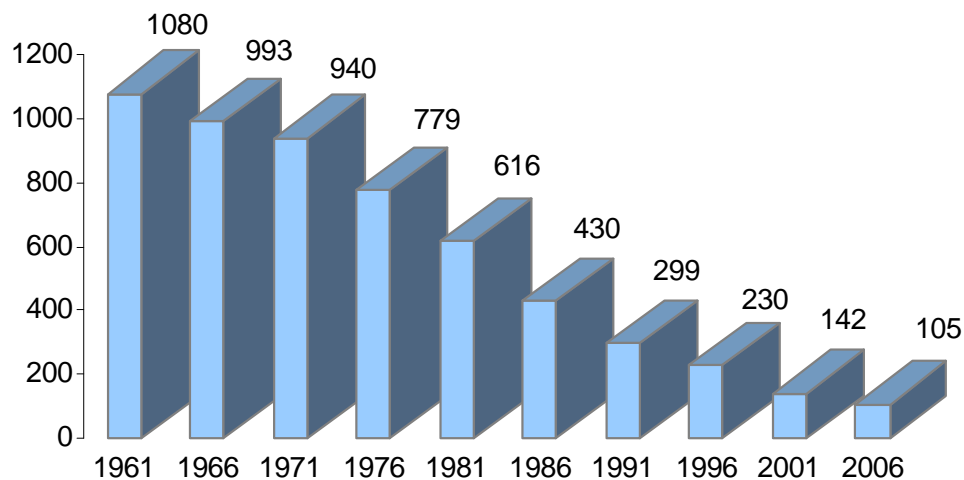
Our assessments have shown:
Water contamination, change in its chemical composition and properties that lead to the quality loss:

❖ *increase in mineralization of lake water and change in its within-year fluctuation during the years with low water.*

❖ *increase in mineralization of river water in the area of intensive runoff consumption;*



Объм (куб.км)



❖ *Water ecosystem degradation and strengthening the Aral Sea crisis.*

❖ *Strengthening the process of desertification.*

❖ *Biodiversity loss.*

Adaptation strategies and measures

- ❖ *Improvement of water resources management system;*
- ❖ *water saving and rational water consumption;*
- ❖ *institutional development in the field of water consumption and supply;*
- ❖ *improvement of irrigation technology*
- ❖ *increase in efficiency of forest management*
- ❖ *national and transboundary aspects of adaptation.*

- ❖ *Definition of the uniform transboundary concept of water consumption in the conditions of expected hydrological drought*
- ❖ *Early warning system of drought*
- ❖ *Development of monitoring of mudflows, outbreking lakes and avalanche*
- ❖ *Development of insurance system against drought and dangerous phenomena*

Thank you for attention

