



## Climate change in Tajikistan Illustrated summary





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#### **Acknowledgement**

Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB) sponsored by the International Development Association (IDA) of the World Bank has provided support for the process of developing methods, approaches, and tools for decision-making support and knowledge products on climate change in Central Asia.

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Produced by Zoï Environment Network

Mountains define the weather and climate conditions in Tajikistan. Winter temperatures in the mountains can be as cold as  $-60^{\circ}\text{C}$ , while summer temperatures in the lowlands can reach  $+40^{\circ}\text{C}$ . Half the country is above 3 000 metres, with the highest summits exceeding 7 000 metres. Glaciers cover nearly 6 per cent of the country, twice the area of its forest cover. Glaciers and snow in the mountains comprise essential water reserves for the Amu Darya River.

Tajikistan is the least urbanized nation in Central Asia. Its rapidly growing population depends on rain-fed agriculture for food, and on irrigated agriculture for cotton exports. Deforestation, soil erosion and excessive livestock grazing are increasing the vulnerability to climate change.

Tajikistan is prone to natural disasters and ranks high on the international climate impact lists. Disruptions in rainfall, growing temperatures, reductions in glacial cover and extreme weather events are among ongoing and anticipated impacts of climate change in Tajikistan. The long-term weather trends show more hot days and fewer cold days with considerable variations in precipitation.

Hydropower generation is highly sensitive to weather and water conditions, and the changing climate is creating new challenges for the planning and management of hydropower plants. Avalanches in winter, flash floods in spring, and high temperatures and dust storms in summer affect both the transport sector and people in their dwellings.

The country's approach to climate actions is the full-scale integration of climate resilience into the planning and rehabilitation of major infrastructure and local adaptation measures. Adaptation measures in agriculture include the use of greenhouses to grow a variety of crops, planting frost- and drought-resistant varieties of fruit trees to protect against extremes and providing shelter and shade for livestock to lessen the risk of heat stress.

Tajikistan's reliance on hydropower has helped keep its total and per person greenhouse gas emissions the lowest in Central Asia, and one of the lowest in the world. While its economy and population grow, Tajikistan has committed to keep its emissions below 1990 levels. Completion of construction of the Rogun hydropower plant may double its clean energy production capacity. A key source of greenhouse gas emissions in Tajikistan remains agriculture, but the country's emissions per unit of agricultural production are the lowest in Central Asia.

# Tajikistan

## Geography and climate

93% mountains

800 mm per year

Glaciers cover 6% of total area

-60°C min

Numerous natural hazards

## Population and economy

27% urban population

Almost 50% of Central Asia water resource formation

Renewable energy 95% of total generation

## Industry

- \* Mining and smelting
- \* Cement

53% GDP

## Services

73% rural population

## Agriculture

Growing use of coal

Migration and remittances

Rapid growth in horticulture

5 million 1991

9 million 2019

Population growth

1 000 US\$ per person 2019

2010

Economy growth 5-7% per year

## Environmental issues

Soil erosion

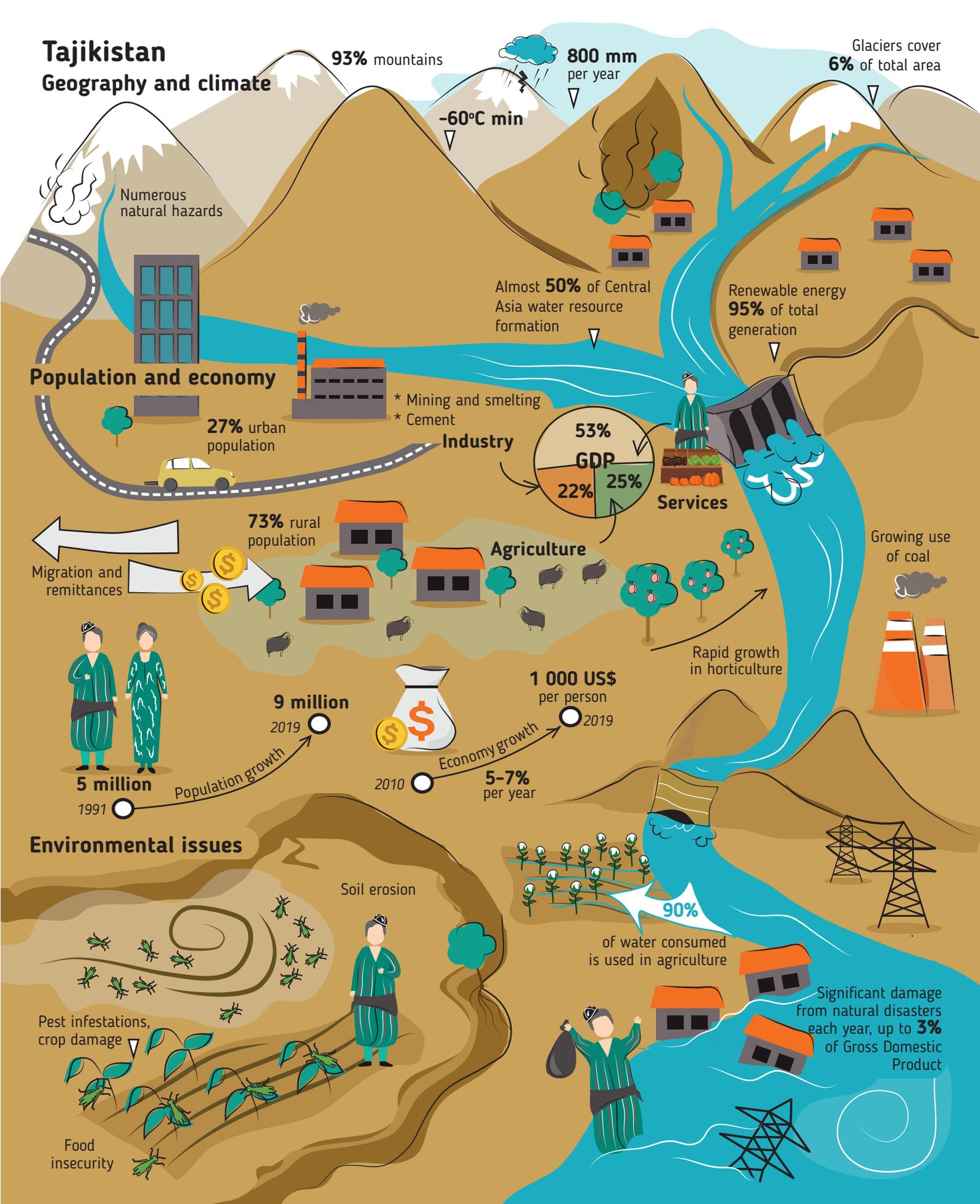
Pest infestations, crop damage

Food insecurity

90%

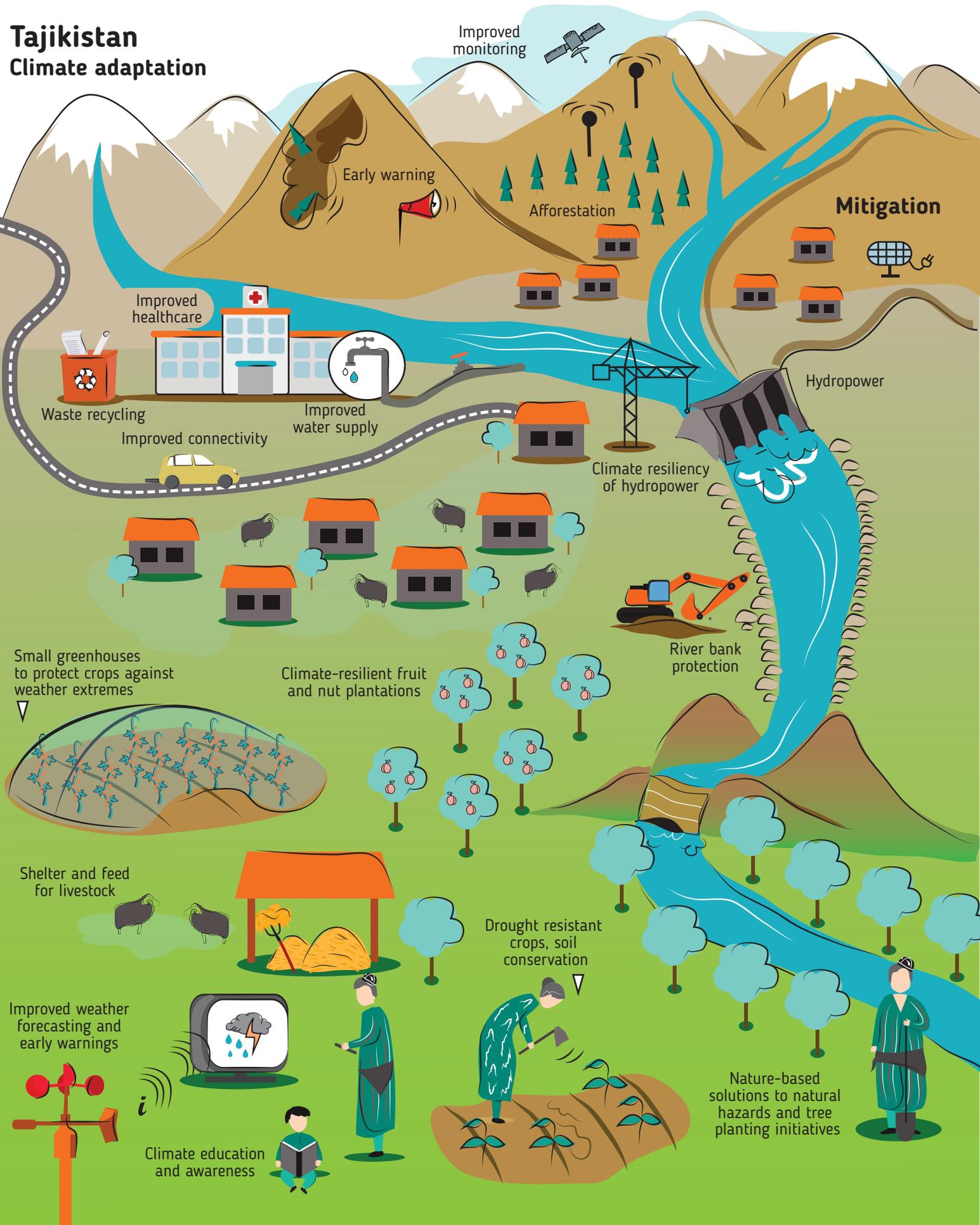
of water consumed is used in agriculture

Significant damage from natural disasters each year, up to 3% of Gross Domestic Product



# Tajikistan

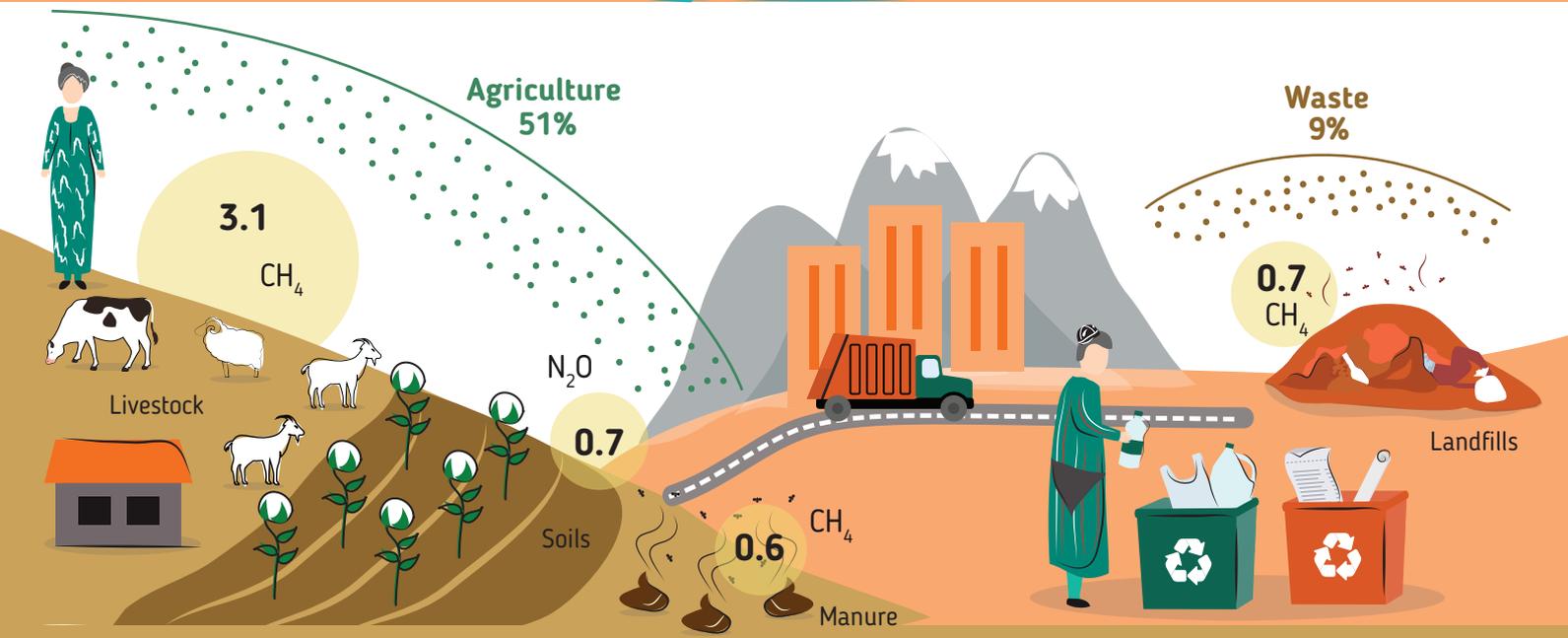
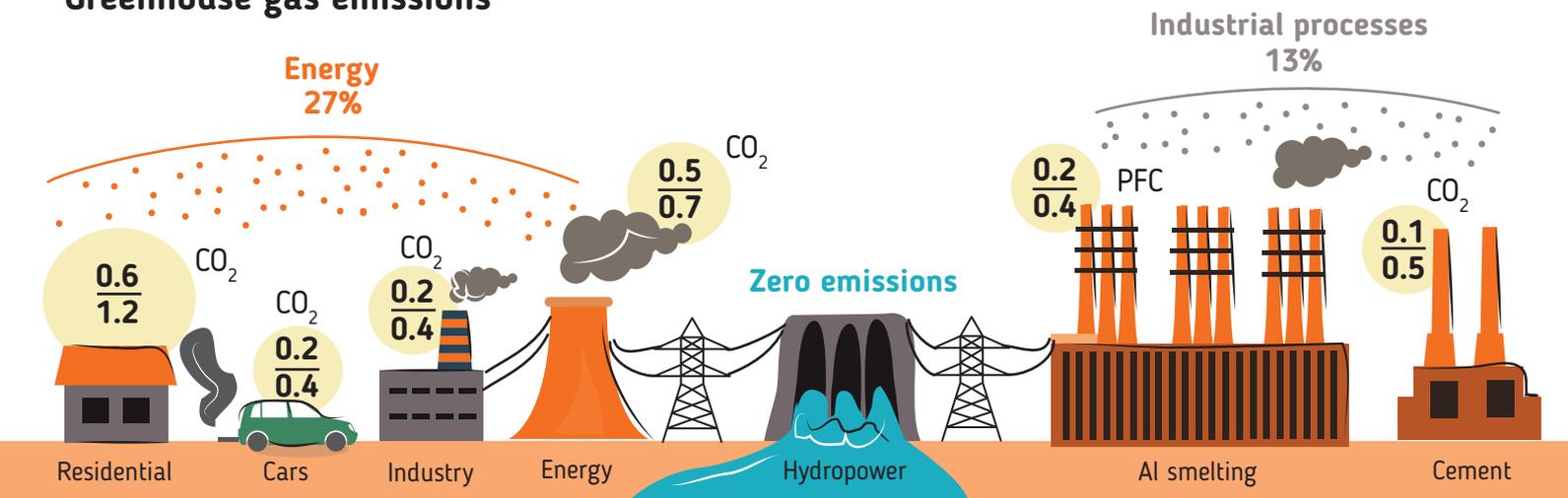
## Climate adaptation



# Tajikistan

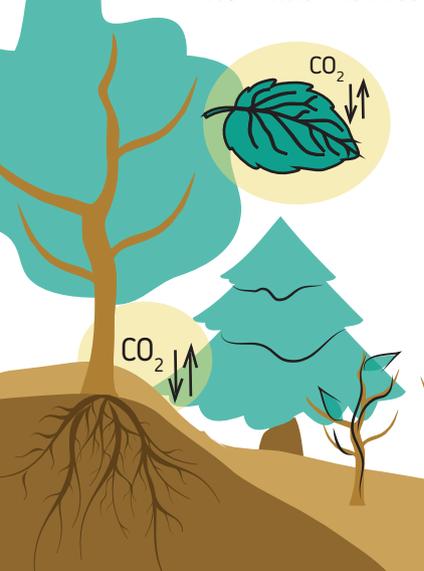
## Greenhouse gas emissions

Million tonnes of CO<sub>2</sub> equivalent

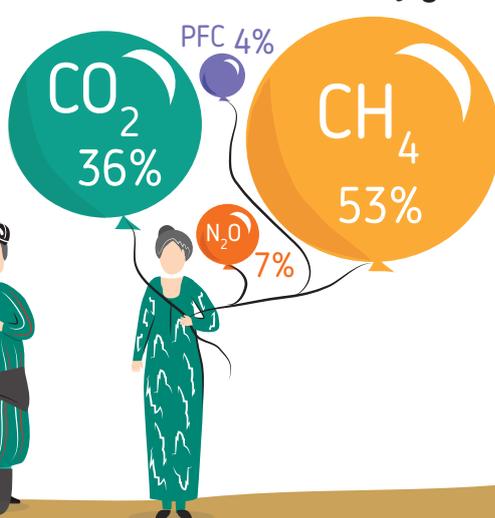


### Forests and land use

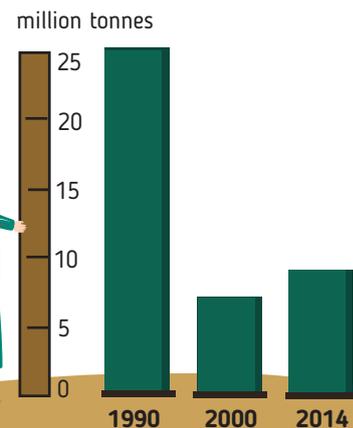
-1.5 million tonnes



### Emissions by gases



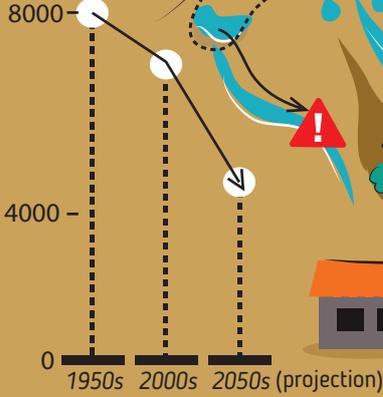
### Emissions by years



Information is based on the national GHG inventories (2010-2012/2014)

# Tajikistan Water

Glacier area, km<sup>2</sup>



Melting glaciers, annual loss **0.1-0.5%**

Contrast trends and variability in river flow increase or decrease

Runoff increase from heavily glaciated areas

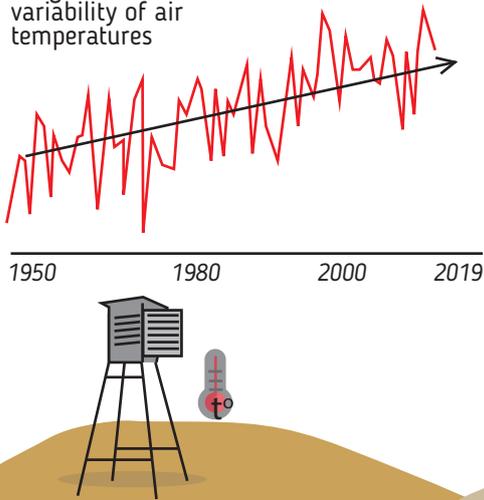
Seasonal shift in river flow

Water flow variability in the Amu Darya River

Jan Jun Dec 1960 1980 2000 2015

# Weather

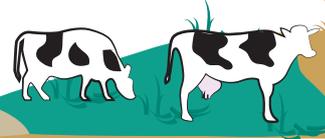
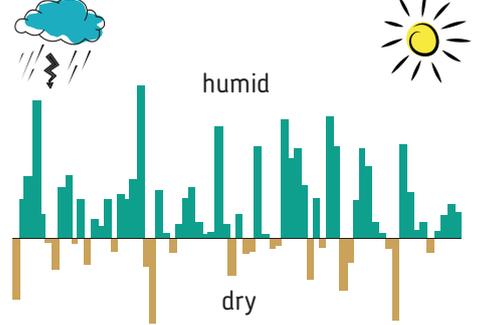
Long-term trends and variability of air temperatures



Number of hot days

Number of cold days

Long-term variability of precipitation



# Impact of climate extremes

Avalanches

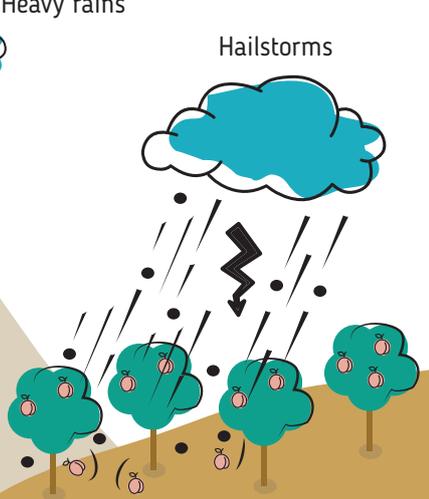
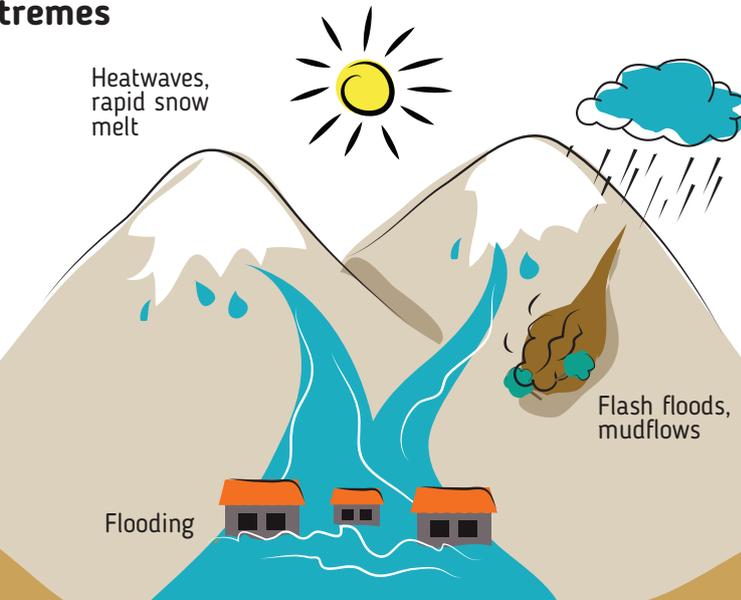
Heatwaves, rapid snow melt

Heavy rains

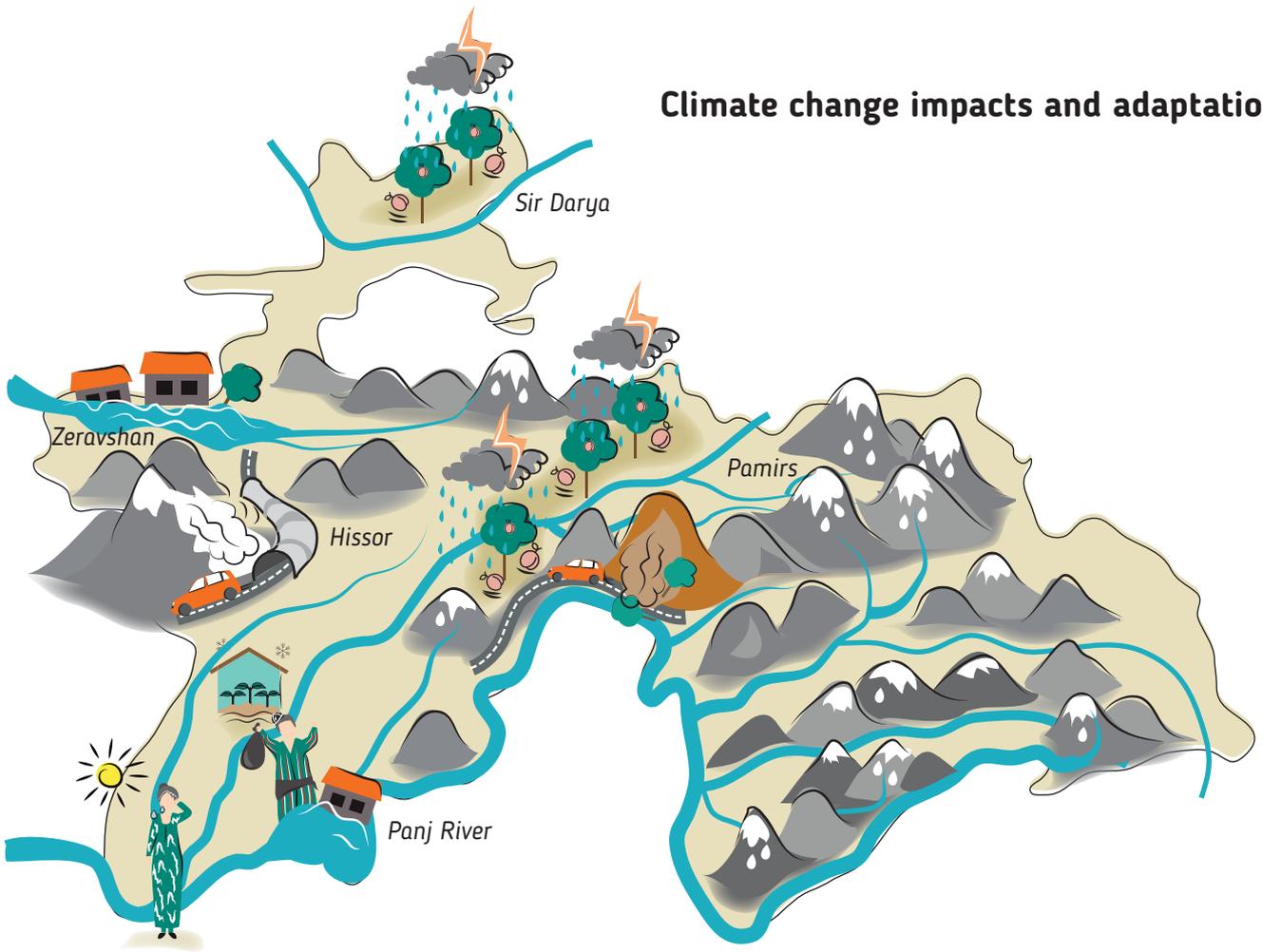
Hailstorms

Flash floods, mudflows

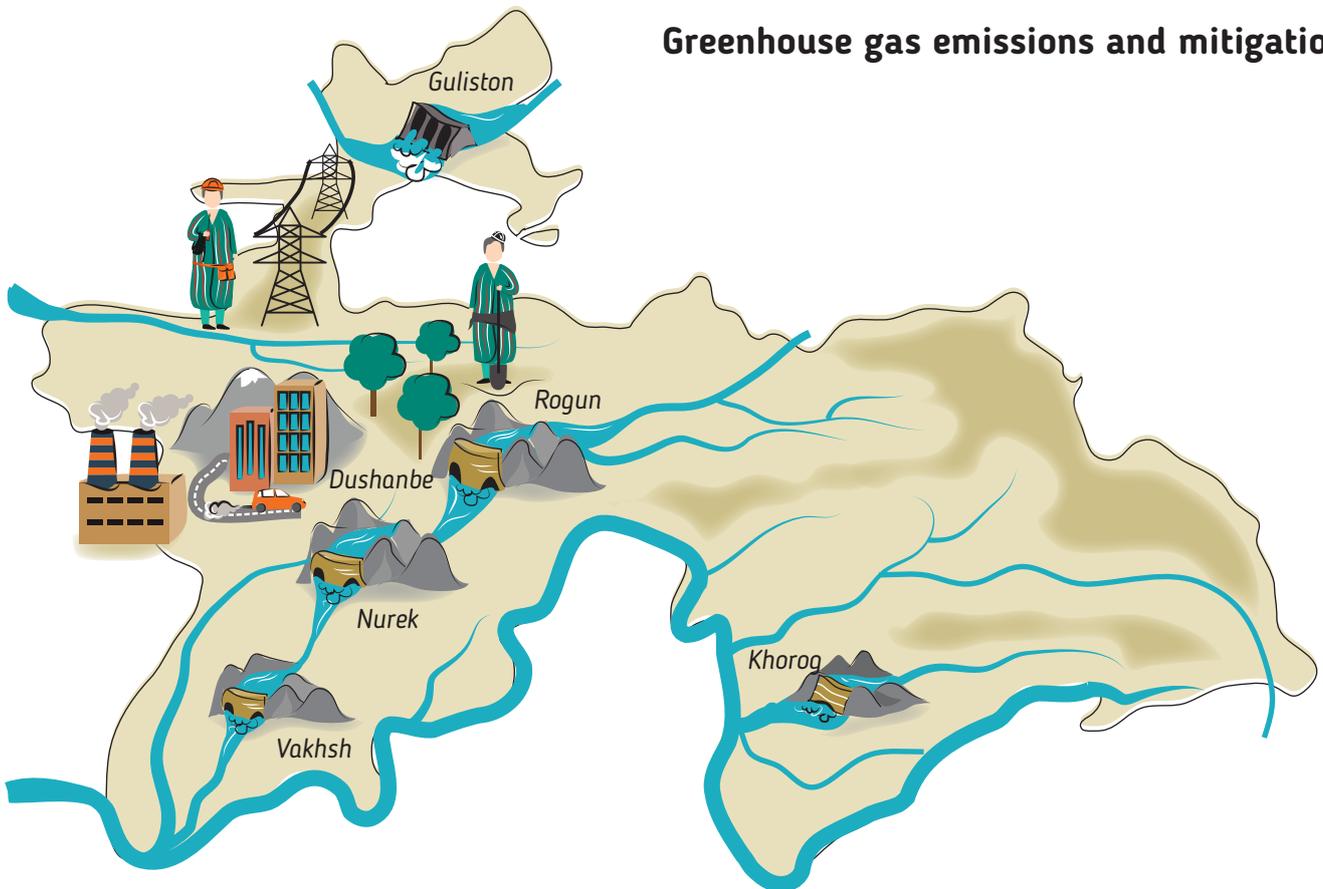
Flooding



## Climate change impacts and adaptation



## Greenhouse gas emissions and mitigation



# Useful links

## **NATIONAL HYDROMETEOROLOGICAL SERVICES OF CENTRAL ASIA: OFFICIAL FORECASTS, CLIMATE AND WATER DATA**

Kazakhstan: [kazhydromet.kz](http://kazhydromet.kz)

Kyrgyz Republic: [meteo.kg](http://meteo.kg)

Tajikistan: [meteo.tj](http://meteo.tj)

Turkmenistan: [meteo.gov.tm](http://meteo.gov.tm)

Uzbekistan: [meteo.uz](http://meteo.uz)

## **REGIONAL CLIMATE, WATER AND ENERGY INFORMATION**

Central Asia climate information portal: [centralasiacclimateportal.org](http://centralasiacclimateportal.org)

Central Asia Regional Environmental Centre (CAREC) [carececo.org](http://carececo.org) and its climate web-page: [ca-climate.org](http://ca-climate.org)

Central Asia Interstate Commission on Sustainable Development (ICSD): [mkurca.org](http://mkurca.org)

Central Asia water and environmental information portal: [cawater-info.net](http://cawater-info.net)

Central Asia Water and Energy Programme: [worldbank.org/en/region/eca/brief/cawep](http://worldbank.org/en/region/eca/brief/cawep)

## **GLOBAL CLIMATE INFORMATION AND DATA PORTALS**

UN Framework Convention on Climate Change (UNFCCC) greenhouse gas data by countries: [di.unfccc.int/detailed\\_data\\_by\\_party](http://di.unfccc.int/detailed_data_by_party)

UN Framework Convention on Climate Change (UNFCCC) national communications: [unfccc.int/non-annex-I-NCs](http://unfccc.int/non-annex-I-NCs) and <https://unfccc.int/NC7>

Intergovernmental Panel on Climate Change: [ipcc.ch](http://ipcc.ch)

International Energy Agency: [iea.org](http://iea.org)

weADAPT: [weadapt.org](http://weadapt.org) and climate action in the mountains [adaptationataltitude.org](http://adaptationataltitude.org)

World Bank climate change knowledge portal: [climateknowledgeportal.worldbank.org](http://climateknowledgeportal.worldbank.org)

World Meteorological Organization, climate data catalogue: [climatedata-catalogue.wmo.int](http://climatedata-catalogue.wmo.int)

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💻 [ca-climate.org](http://ca-climate.org)

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💻 [tajnature.tj](http://tajnature.tj)

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