

# Azerbaijan Case Study: Local Solutions for Climate Resilience

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**Eighth CAREC Think Tank Development Forum  
Ritz-Carlton Almaty,  
27 August 2024**

# Topic Overview

- Azerbaijan's innovative approaches to climate change adaptation
- Localized solutions leveraging technology and community involvement.

Political map of the Republic of Azerbaijan



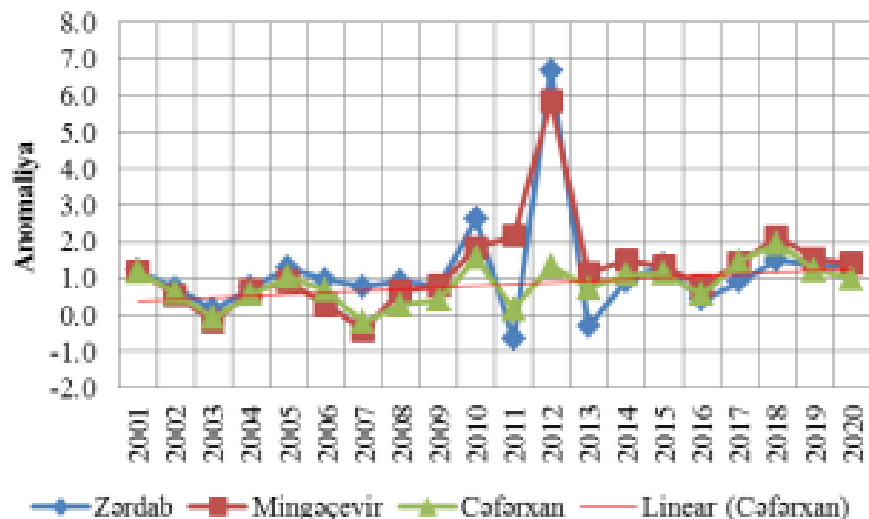
# Azerbaijan's Climate Context

- With a population of around 10 million people, the share of the Republic of Azerbaijan in global warming has historically been negligible:
- Azerbaijan contributes only 0.15% of total global Greenhouse gasses emissions.
- In 2016, the amount of GHG was estimated at 61.257 Mt of CO2 equivalent, and net emissions, taking into account the removals, were estimated at 54.033 Mt of CO2 equivalent
- However, the physical and geographical characteristics of Azerbaijan make it a highly sensitive country to the effects of climate change, especially in increase in the number of droughts, thermal stresses, floods, and other dangerous natural phenomena.
- Per capita emissions amounted to 6.3 tons of CO2 equivalent, and net emissions, taking into account the removals, amounted to 5.6 tons of CO2 equivalent.
- For comparison, in 2016, the world average per capita emissions (absorption) were 6 tons of CO2 equivalent, but in developed countries such as Germany and Austria, for example, these figures were 9.79 tons and 7.74 tons of CO2 equivalent, respectively.
- According to the GHG inventory for 1990-2016, in 2016 Azerbaijan achieved a 31.6% reduction in emissions compared to the base year (1990).

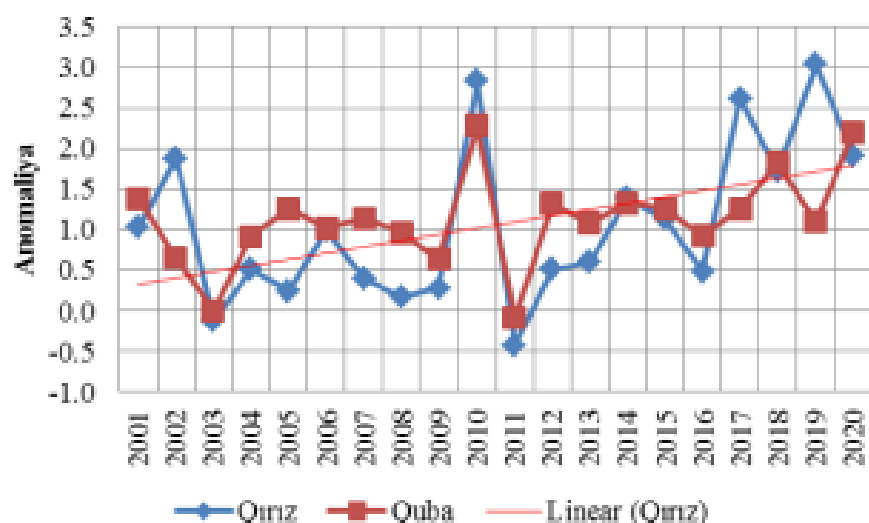
# Current Impacts:

- Average temperature in the country for the last 20 years (compared to the temperature norms of 1971-2000) increased by 1.5°C
- The last 10 years have been the hottest decade in our country!
- As a result of climate change, water resources have decreased by 15% over recent decades in Azerbaijan
- growing water shortage cause high vulnerability in different sectors: water resources, human health, agriculture, and forestry
- to ensure resilience to the hazardous hydrometeorological events, modern system of early warning established

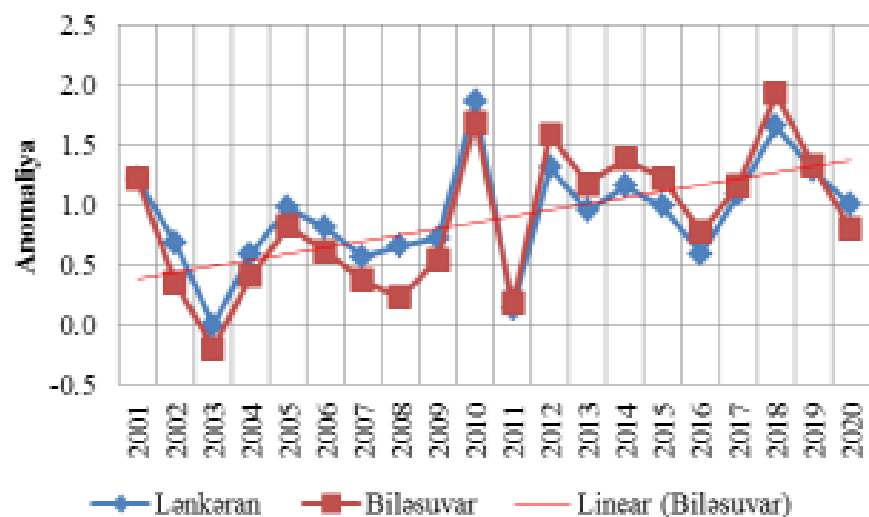
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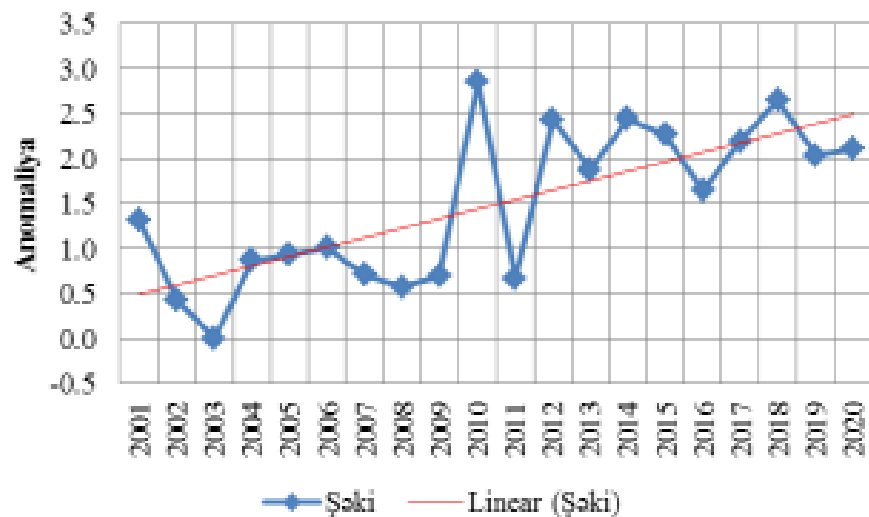
### North-Eastern



### South



### North-Western

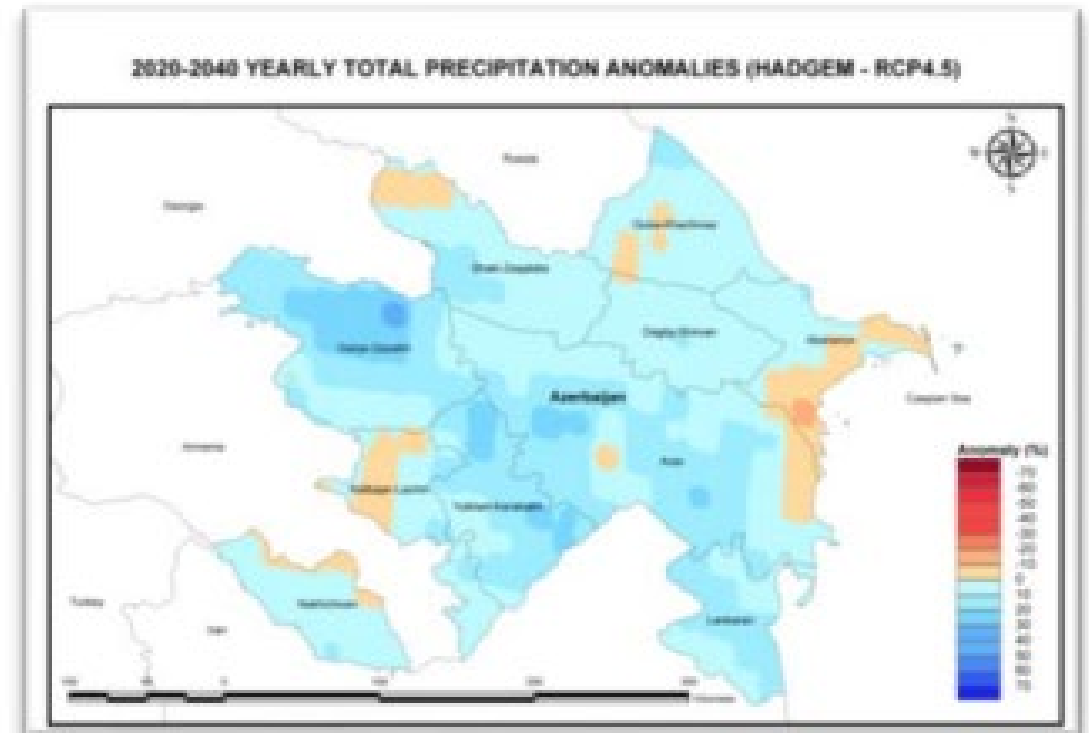
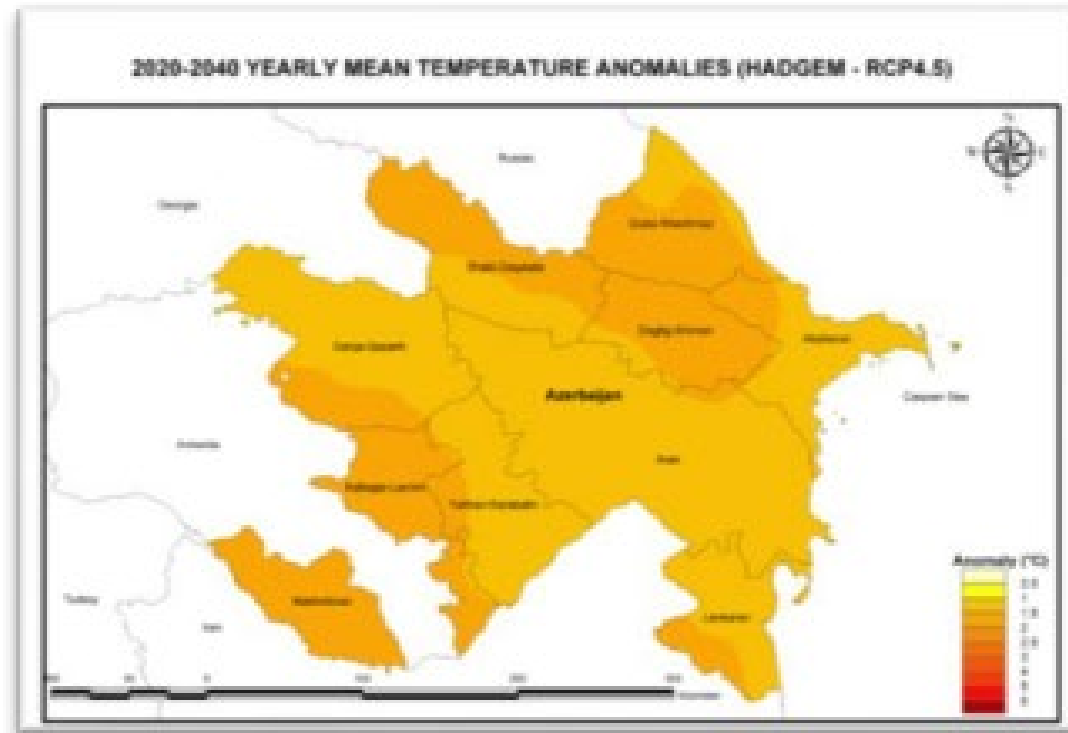


# Climate scenarios

- future climate scenarios for Azerbaijan were developed with the support of experts from the Turkish State Meteorological Service.
- From all three models, calculations were made for 4 periods in 1970-2100 with RCP4.5 and RCP8.5 scenarios:
- the first period covers the years 1971-2000 and acts as a base climate
- the second scenario period covers the 2020-2040 years;
- the third scenario period covers the 2041-2070 years;
- the fourth scenario covers the 2071-2098 years.
- IPCC emission scenarios have been identified mainly in relation with demography, economy, technology, energy, and agricultural development.

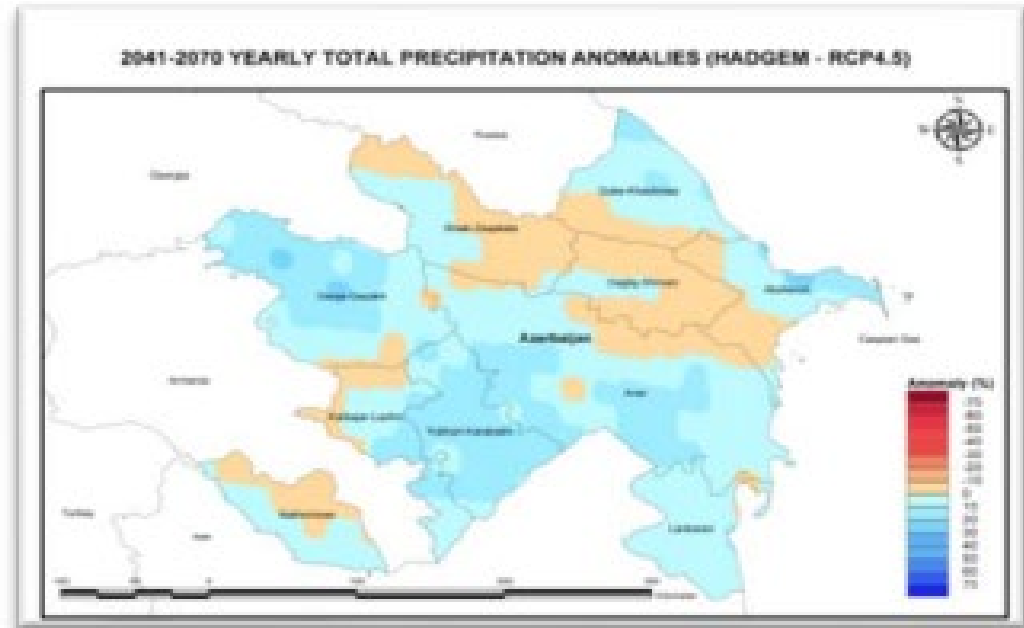
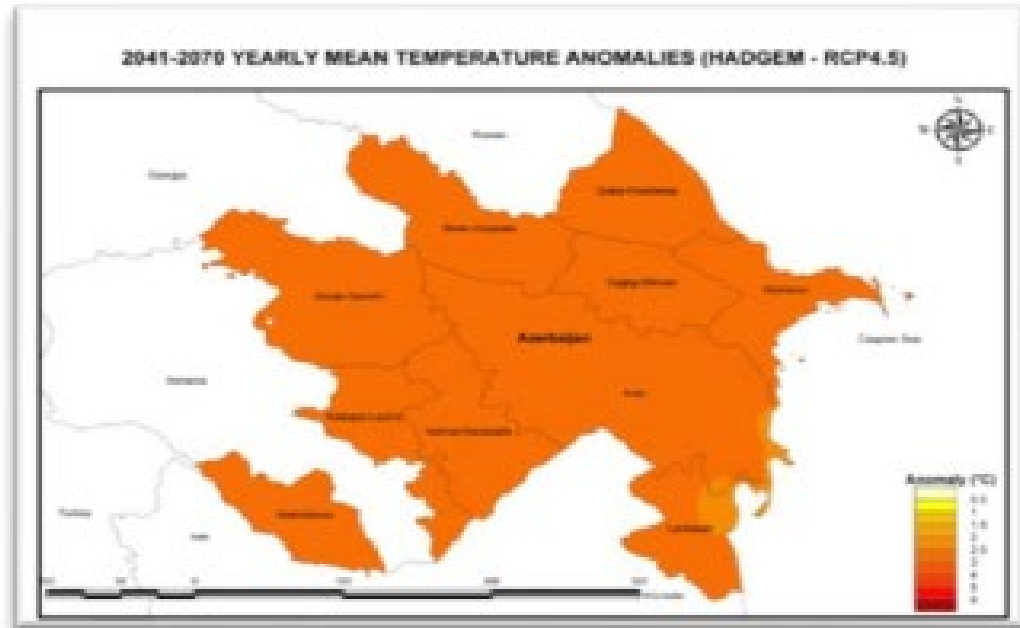
# Temperatur and precipitation forecast- 2020-2040

- According to the HADGEM model, the average annual temperature is expected to increase by 1-2°C in 2020-2040 (compared to 1971-2000), the amount of precipitation to decrease by 10-20% in some areas and increase by 10-40% in most areas



# Temperatur and precipitation forecast- 2041-2070

- by 2-3°C in 2041-2070. In 2041-2070 (compared to 1971-2000), the amount of precipitation in the country will decrease by 10%, mainly in the highlands of the Greater Caucasus, Shirvan and Nakhchivan, and increase by 10-30% in most areas





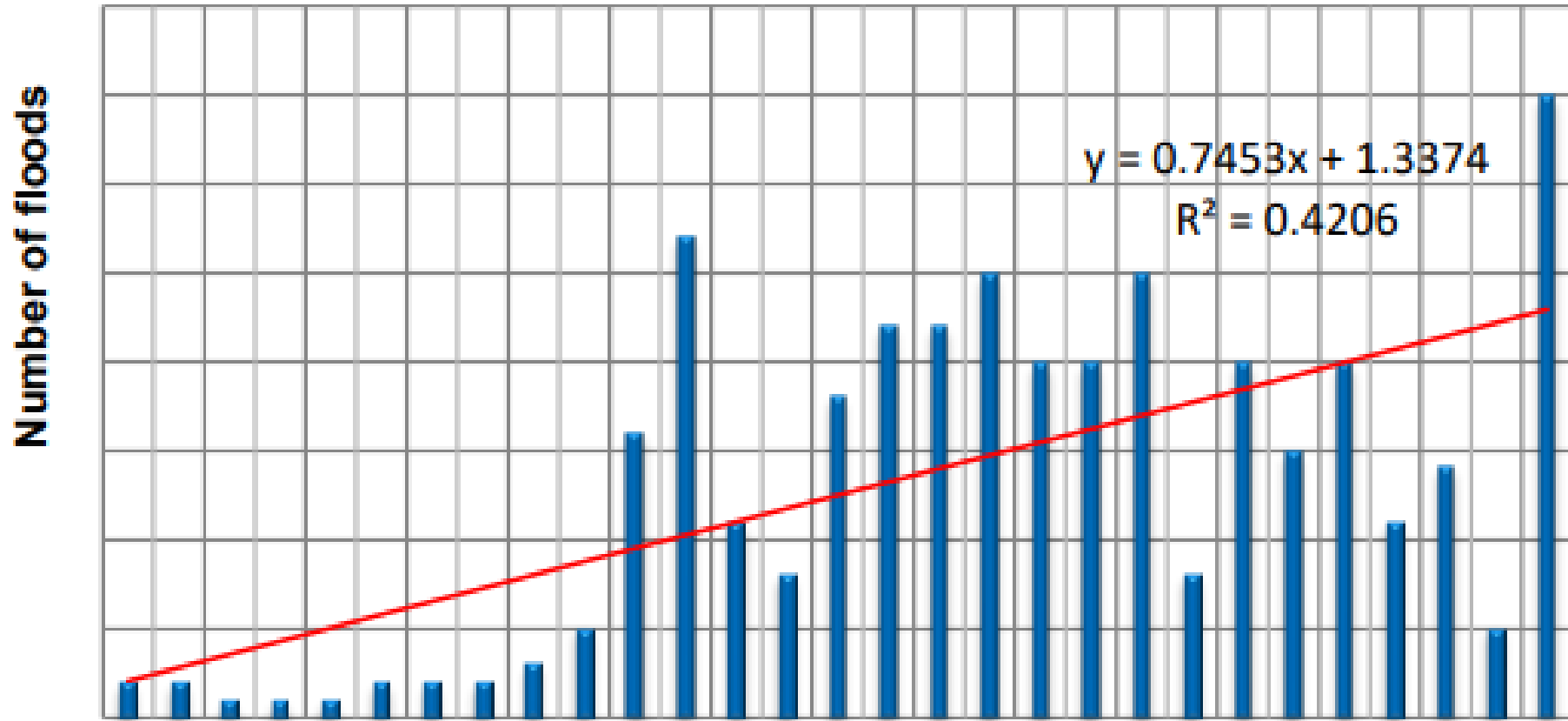
# Adaptation measures

- Establishment of the Early Warning System
- Modernization of observation systems
- Develop a Hydrometeorology Development Strategy for 2025- 2030
- Environmental pollution monitoring system

# Adaptation measures in agricultural sector

- to mitigate and reduce the negative effects of expected climate change:
  - cultivation of long-growing, heat-loving, drought-resistant agricultural crops in the conditions of climate change in Azerbaijan,
  - creation and zoning of new varieties in this regard;
  - application of advanced irrigation methods in case of water shortage, use of alternative water sources;
  - the establishment of fieldprotective forest strips around the soils,
  - registration of eroded and saline soils, mapping,
  - creation of artificial water basins to capture atmospheric precipitation and use them for irrigation;
  - improving irrigation and drainage systems to combat salinization on farms;
  - establishment of small processing enterprises for perishable products in rural areas;
  - continue the works on improvement of storage systems for agricultural products (warehouses, refrigerators, etc.) and create new ones.

## Multi-annual scheme of floods observed in the rivers of Azerbaijan Republic



Flood Trends observed in 1996-2020 (NHS)

# To mitigate and minimize the expected adverse effects of climate change on water resources

- Reconstruction of existing water facilities in order to reduce water loss;
- Involving additional water sources such as use of rainwater and treated seawater, etc.;
- Use of recirculated water, including groundwater and water reuse;
- Flow regulation and economical use of water in times of scarcity;
- Conduct reforestation measures in torrent and flood prone areas;
- Implementation of protective engineering measures in basins and in floodplains of rivers;
- Construction of HPPs on mountain rivers and new reservoirs;
- Construction of small HPPs on existing irrigation canals;
- Purify and reuse water;
- Use of modern irrigation technologies and methods.

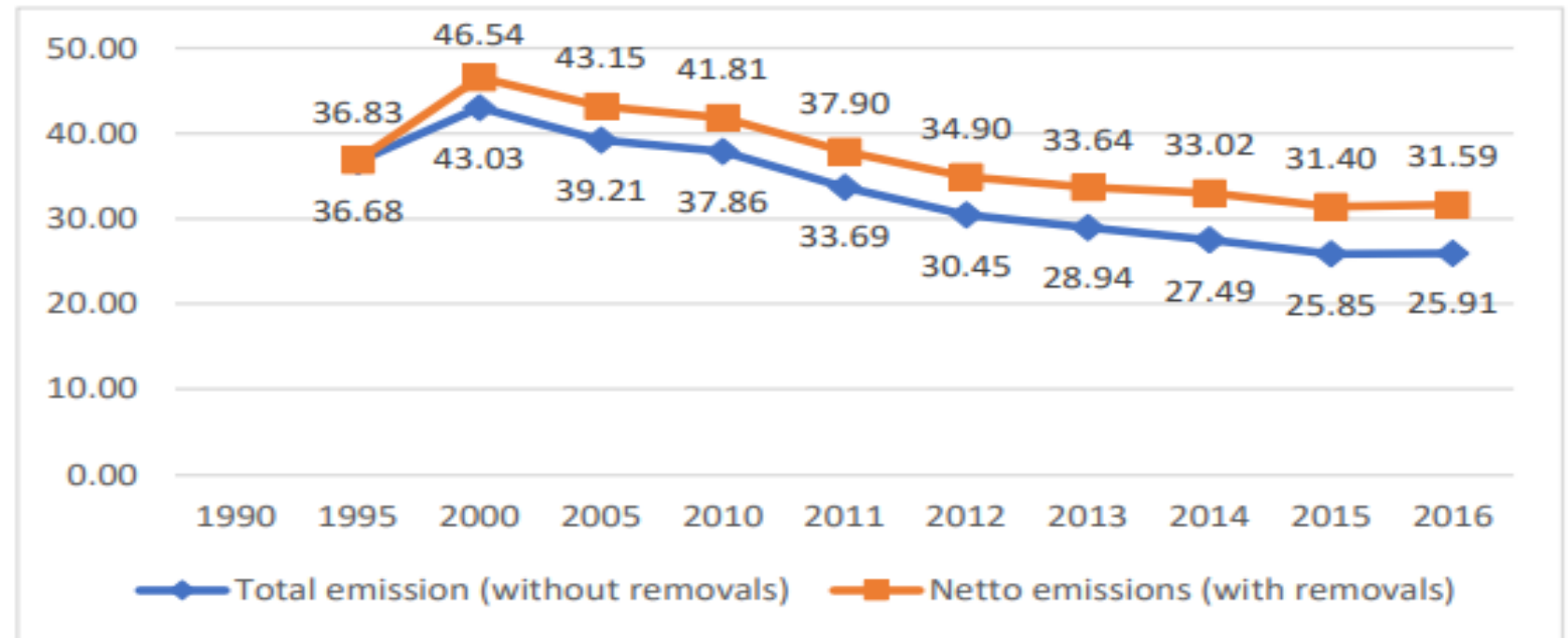
# Adaptation measures against diseases transmitted through water and food:

- water treatment and quality improvement;
- improve and strengthen the water quality control system;
- accelerate the work on providing all settlements with drinking water;
- develop strategy for proper and efficient use of drinking water sources in the context of climate change;
- improve and strengthen the control system over the implementation of food storage standards;
- broaden sanitary-epidemiological awareness of the population in this issue;
- if necessary, organize speeches of specialists in the media on the prevention of acute intestinal infections.

# Key Initiatives in Azerbaijan

- Signed the Paris Agreement in April 2016 and submitted its Nationally Defined Contributions (NDC) document to the Secretariat of UNFCCC in October 2015 and targeted to **achieve 20% reduction** in the greenhouse gas emissions (GHG) level by 2030 compared to the 1990 base year.
- At present, submitted an ambitious commitment in NDC **to reduce 35%** of Greenhouse Gas emissions by 2030.
- Energy, industry, agriculture, land use and forestry, and waste management are the priority sectors.

**Chart 1.** Year-by-year decline trend in GHG level compared to the net indicator of 1990 (in %)



# CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

- in September 2015, the Republic of Azerbaijan joined the “Sustainable Development Agenda for 2016-2030”, which was approved at the UN Summit on Sustainable Development in New York and launched the enforcement process for SDGs
- (17 SDGs, 169 targets and 232 indicators). Seven of the SDGs, namely the SDG 6, SDG 7, SDG 11, SDG 12, SDG 13, SDG 14, SDG 15 directly deal with mitigation of environmental and climate change and other issues, and SDG 8 and SDG 9 touched upon the topic indirectly
- In 2016 the National Coordination Council for Sustainable Development of the Republic of Azerbaijan in which the leaderships of the relevant state agencies (including the State Statistical Committee) are represented, was set up under the chairmanship of Deputy Prime Minister
- An important institutional measure to mitigate climate change impacts is the establishment of the State Agency for Alternative and Renewable Energy Sources (SAARES) in 2013.
- “National Strategy for Improving Solid Waste Management in the Republic of Azerbaijan for 2018-2022” was adopted on November 1, 2018,
- “National Strategy for Low Carbon Development” is currently being developed
- measures to ensure the implementation of the commitments made by the Republic of Azerbaijan in accordance with the United Nations Framework Convention on Climate Change approved by the Republic of Azerbaijan on 11.03.2020

# Legal framework for measures to reduce GHG emissions

- National program on restoration and expansion of forests in the Azerbaijan Republic
- Transport sector development strategy
- State Program on Development of Fuel and Energy Sector in the Republic of Azerbaijan

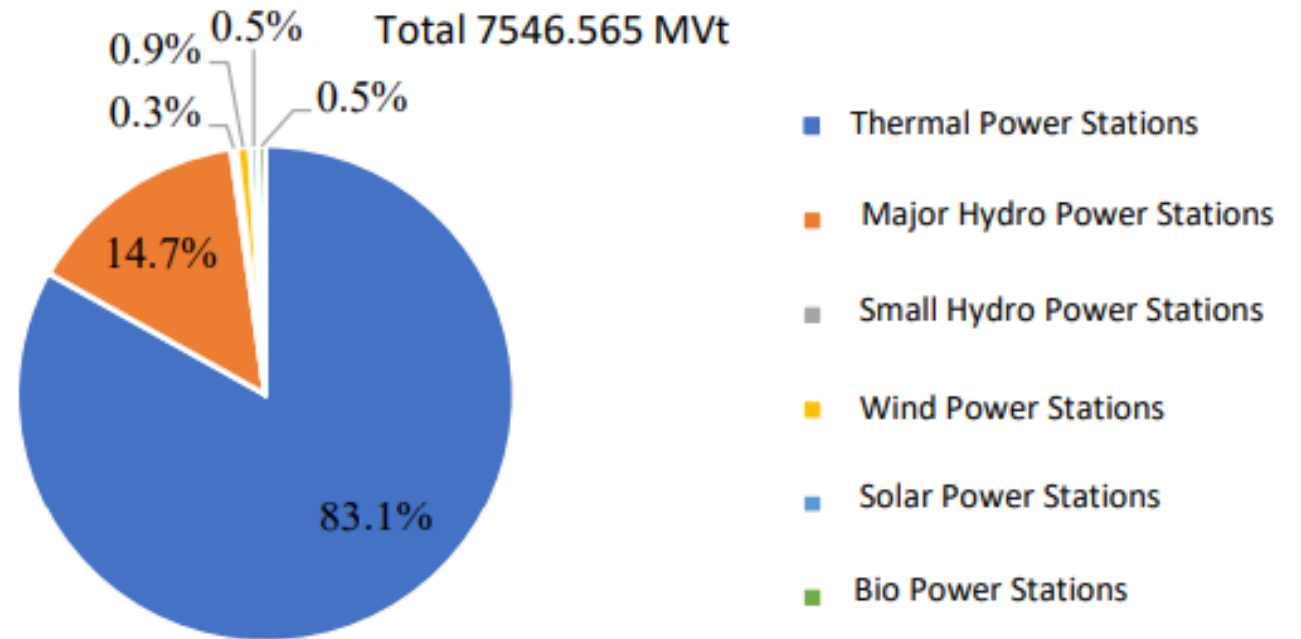
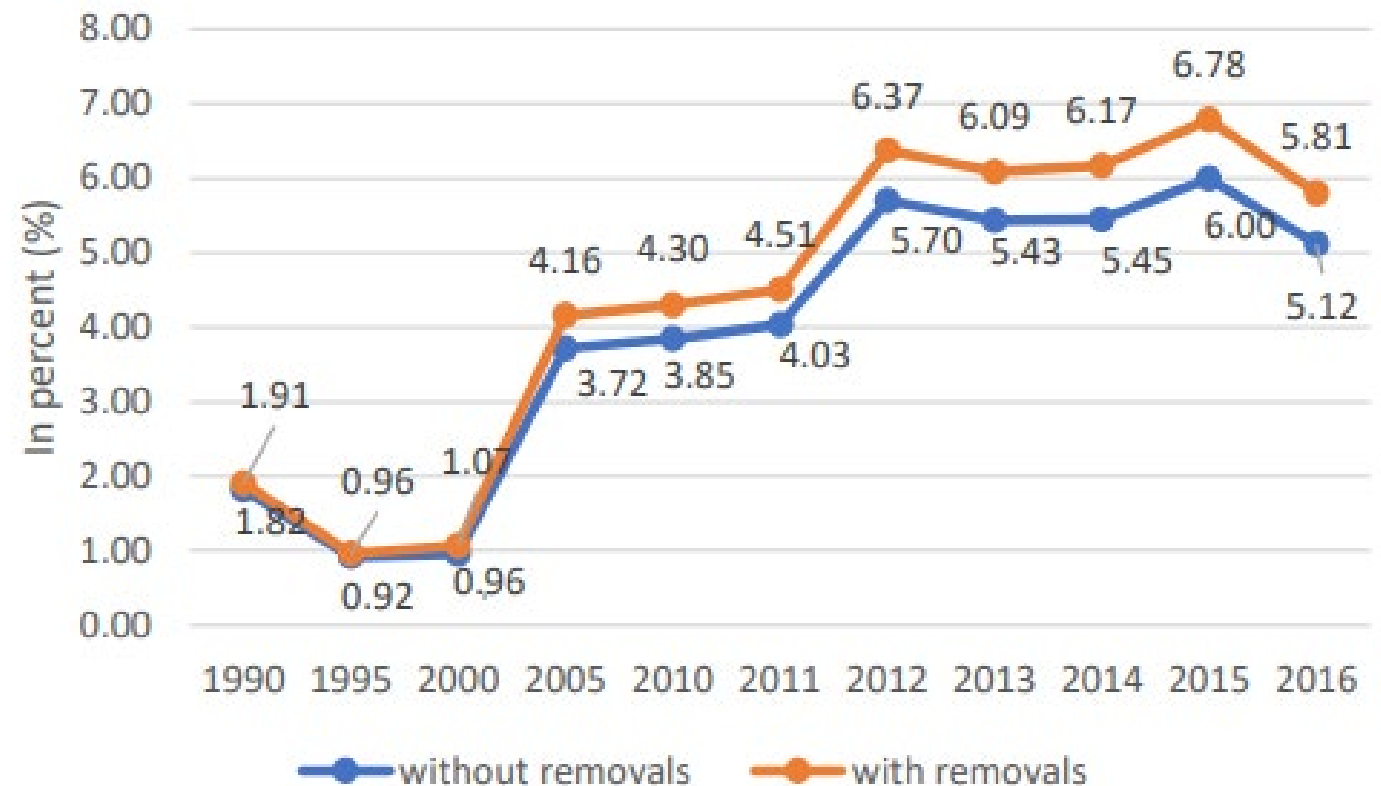


Chart Electric power systems installed capacities in the Republic of Azerbaijan



- The sources and categories of GHG emissions in the Industrial Processes and Product Use (IPPU) sector are:
- mining products,
- chemical industry,
- metal industry,
- other production areas,
- production of halogenated carbon and sulfur hexafluoride



**Chart 3. Annual trend of GHG emissions share in total GHG in the IPPU sector (in %)**

To reduce GHG emissions in the IPPU, the list some sectoral international conventions to which Azerbaijan is a party. These are:

- Convention on Environmental Impact Assessment in Transboundary Context (joined in 1999);
- Montreal Protocol on Substances that Deplete the Ozone Layer (joined in 2000);
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (joined in 2001);
- Stockholm Convention on Persistent Organic Pollutants (joined in 2001)

Agricultural sector ranks second in the country for the total share of GHG after the energy

GHG emissions in this sector in 2014 accounted for approximately 14.32 percent of total emissions (excluding removals), and 14.1 percent in 2015.

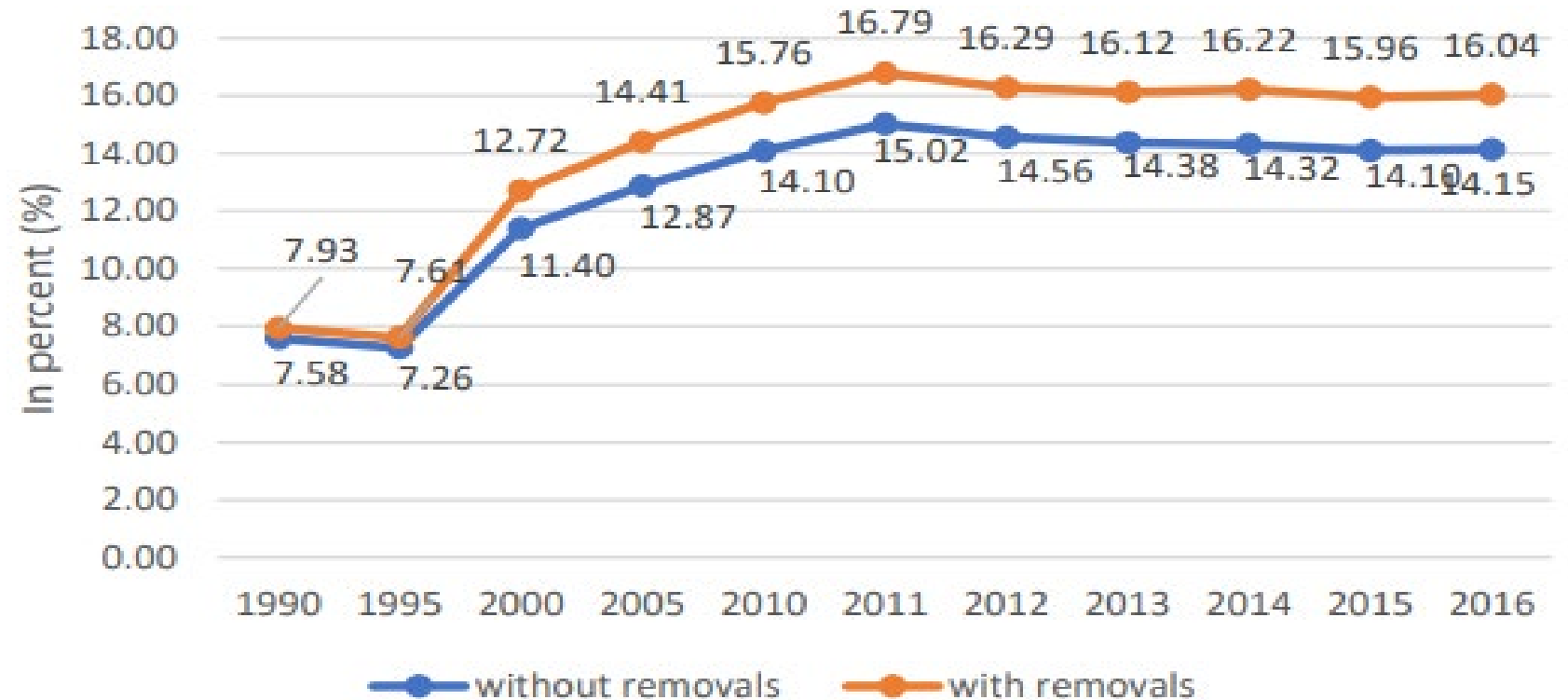


Chart 4. Annual trend of the share of GHG emissions in the AFOLU sector in the total GHG emissions, (in%)

# Government programs

- State Program on Rational Use of Summer and Winter Pastures, Hayfields and Prevention of Desertification in the Republic of Azerbaijan (2004-2010)”,
- “State Program on Reliable Food Supply of the Population in the Republic of Azerbaijan in 2008-2015”,
- “State Program on Poverty Reduction and Sustainable Development in the Republic of Azerbaijan in 2005-2008”,
- “State Program on Social and economic Development of Regions of the Republic of Azerbaijan in 2014-2018”,
- “Strategic Roadmap for Production and Processing of Agricultural Products in the Republic of Azerbaijan 2016-2022”,

# Forestry

- the FAO estimates that currently 1.2 billion hectares of the world's land fund is already moderately and severely degraded.
- 20 percent of arable land, 30 percent of forests and 10 percent of pastures are degraded globally.
- In the XVII-XIX centuries, 35% of the territory of Azerbaijan was covered with forests, currently the total area of Azerbaijan forests is only 1.021 million hectares, which is 11.8% of its total area.
- For comparison, this figure is 44% in the Russian Federation, 41% in Latvia and 39% in Georgia
- expanding the share of forest areas in the total land area to 12.5% by the end of 2015 targeted in the "State Program on Poverty Reduction and Sustainable Development in the Republic of Azerbaijan for 2008-2015
- "National Strategy for Improving Solid Waste Management in the Republic of Azerbaijan for 2018- 2022 envisages the establishment of Regional Solid Waste Management Centers for all regional centers and cities of the country. At these centers, the waste will be burned in incinerators, and this process will continue until 2030, with an additional 10% of the incineration rate each year

- Contribute to mitigation initiatives the rehabilitation of liberated territories includes the application of "smart city" and "smart village" approaches, and creation of "green energy zone"
- State Commission on Climate Change ensures smooth coordination between all stakeholders in the field of climate change on the national level and contributes to implementation of obligations under the United Nations Framework Convention on Climate Change.
- Ratification of the UN Framework Convention on Climate Change by the Republic of Azerbaijan in 1995, and the Kyoto Protocol in 2000.
- Commitments made to the Convention to provide GHG institutional framework for assessing anthropogenic emissions and removals and to report to the Secretariat of the Convention on an ongoing basis.
- The Action Plan between Azerbaijan and the European Union within the framework of the European Neighborhood Policy for European Integration, adopted by the Government of Azerbaijan on November 14, 2006, pays special attention to the development of statistics in Azerbaijan

# Paris Agreement

- The obligations of the Republic of Azerbaijan arising from the Paris Agreement of the UN Framework Convention on Climate Change and the fulfillment of these obligations are among the priorities for the Government of the Republic of Azerbaijan.
- In general, the main goal of the responses taken by countries within the Paris Agreement is to keep the average value of global temperature rise well below 2°C for the next 100 years.
- COP 29 will be held in Azerbaijan on Nov 11-22 2024

# Monitoring, Reporting and Verification (MRV) system for the GHG inventory

- Climate Change Center has been established within the MENR to coordinate the national GHG inventory.
- The Center is responsible for collecting data from relevant government agencies as part of GHG inventory coordination, obtaining relevant opinions and suggestions on GHG inventory reports, and archiving data.
- In 2014, the annual official statistical report #2-TG (air) “On protection of ambient air” was complemented with GHG inventory section in order to improve the Monitoring, Reporting and Verification (MRV) system for the GHG inventory for obtaining direct data from industrial enterprises.
- These reports are submitted online by industrial enterprises to the State Statistics Committee once a year upon the MENR’s approval.
- GHG inventory process was carried out in Azerbaijan first in 1998-2000 under “First National Communication report for UN Framework Convention on Climate Change”.
- GHG Inventory of the report covered 1990-1994 years. GHG inventory process for the following years was carried out under subsequent National Communication reports.
- Regional Project on GHG inventory quality improvement was implemented with the assistance of UNDP-GEF in 2003-2006 years.



# Concrete Examples

- In 2019, by the initiative of the First Vice President of the Republic of Azerbaijan, 650,000 trees were planted
- greening activities such as the establishment of modern agro-forest massifs are being implemented for reduction of carbon dioxide emissions.
- Azerbaijan has also joined the Bonn Challenge with the commitment of bringing 270 thousand hectares' forest land into restoration by 2030.
- Azerbaijan set the target to increase the share of renewable energy in power generation up to 30% by 2030 despite long the history of oil and gas industry development.

# Case Study 1: Smart Irrigation Systems

- **Overview:**

- Implementation of technology to optimize water use.

- **Outcomes:**

- Increased crop yields.
- Reduced water wastage.

- **Challenges:**

- Initial cost and technology adaptation.

- **2019-2020 Action Plan** for reducing the negative impact of plastic packaging waste on the environment in the Republic of Azerbaijan was approved by Decree no. 935 dated February 7, 2019 of the President of the Republic of Azerbaijan.
- Based on the assessment of the negative impact of the mass use of plastic packaging products on plants, animals, land and water resources in order to implement measures aimed at reducing pollution in this area.
- The Action Plan covers the strategic vision, the long-term vision for the period up to 2025, and the targeted vision by 2030.
- It provides for the implementation of large-scale measures to achieve efficient management and a high level of service.
- More than 250 containers are put into use in densely populated areas of 37 cities and regions, including Baku, Sumgait, and Ganja.



# Containers for the collection of plastic packaging waste



# Case Study 2: Renewable Energy Projects

- **Overview:**

- Solar and wind energy initiatives.

- **Outcomes:**

- Reduction in carbon footprint.
- Energy access improvement in remote areas.

- **Challenges:**

- Infrastructure development and maintenance.

# Community-Based Adaptation Projects

- In the framework of the National Adaptation Plan project, financed by the Green Climate Fund and implemented by the United Nations Development Programme in Azerbaijan in partnership with the Academy of Public Administration under the President of the Republic of Azerbaijan, the second phase of executive-level courses on Climate Change Adaptation for civil servants has been successfully completed. These executive-level courses focused on vital topics such as “The essence of Climate Change Adaptation”.
- Dedicated civil servants are now better equipped with the knowledge and tools to tackle the challenges of climate change.
- The training program on Climate Change Adaptation was held on July 22-26, 2024, and invited employees from relevant government entities participated successfully.

# Conclusion

- **Summary:**

- Azerbaijan's innovative and localized solutions contribute to climate resilience.
- Importance of collaborative efforts and continued investment in technology and community engagement.

- **Future Directions:**

- Expansion of successful initiatives.
- Increased focus on sustainability and adaptation strategies.
- The only way to achieve positive results in reducing the impact on environment is consolidation of efforts of each and every country to ensure safe and resilient future. No country on this planet will be able to act alone. We should use every opportunity which may lead to development of regional interaction.

# Q and A

- **Invitation for Questions and Discussion**