

Modern concepts of sustainable development and «green economy» Global Challenges of the 21st Century

**Global Problems
RIO92**

**Subject : ECOLOGICAL PROBLEMS OF KAZAKHSTAN
Modul1 Lectures - 1-2**

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2022

SUSTAINABLE DEVELOPMENT IS THE DEVELOPMENT PARADIGM OF THE XXI CENTURY. RIO92 and RIO+20

- ▶ **HUMAN AND ENVIRONMENT**
- ▶ The environment and man are components of the material world
- ▶ On the one hand, a person as a biological organism is part of the environment and depends on natural conditions.
- ▶ On the other hand, a person consumes natural resources and saturates the environment with the waste of his life; changes the environment and adapts it to his needs.

ENVIRONMENT

From an environmental point of view:

Environment - the habitat of living organisms, part of nature with which organisms directly interact

From the standpoint of the functioning of human society:

Environment - the environment of human habitation and activity, the natural environment surrounding a person and the material world created by him

In a broad sense - the planet Earth and Space

In a narrow sense - the biosphere

ENVIRONMENT

NATURAL ENVIRONMENT

nature, a combination of abiotic and biotic factors that affect humans and other organisms.



TECHNOGENIC ENVIRONMENT

human-modified natural environment (for example, urban environment).



DISTINCTIVE FEATURES OF POST-INDUSTRIAL SOCIETY

- ▶ **The concept of sustainable development**
- ▶ **Increasing the role of information and knowledge in the life of society**
- ▶ **Increasing share of information communications, products and services in gross domestic product (GDP)**
- ▶ **Science-intensive and resource-saving technologies**
- ▶ **Strengthening the role and importance of the human factor**
- ▶ **Globalization of society**
- ▶ **Greening socio-economic development**

GLOBAL PROBLEMS

Global problems of our time

(French global - universal) is a set of problems of mankind, the solution of which depends on social progress and the preservation of civilization.

Features of global problems:

- ❖ have a planetary, global character, affect the interests of all peoples of the World;
 - ❖ threaten degradation and death to all mankind;
 - ❖ need urgent and effective solutions;
 - ❖ require the collective efforts of all States.
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- ❖ **ALL GLOBAL PROBLEMS OF HUMANITY GROW FROM ENVIRONMENTAL PROBLEMS !!!**

GLOBAL PROBLEMS



- ▶ *The issue of climate change*
- ▶ The increase in the Earth's temperature associated with natural reasons and human activity (CO2 emission, pollution, waste accumulation).
- ▶ **Consequences:** increased uneven precipitation, rising sea levels, reduced snow mass in high latitudes, retreat of glaciers and other global changes associated with climate warming.

Melting glaciers in Greenland

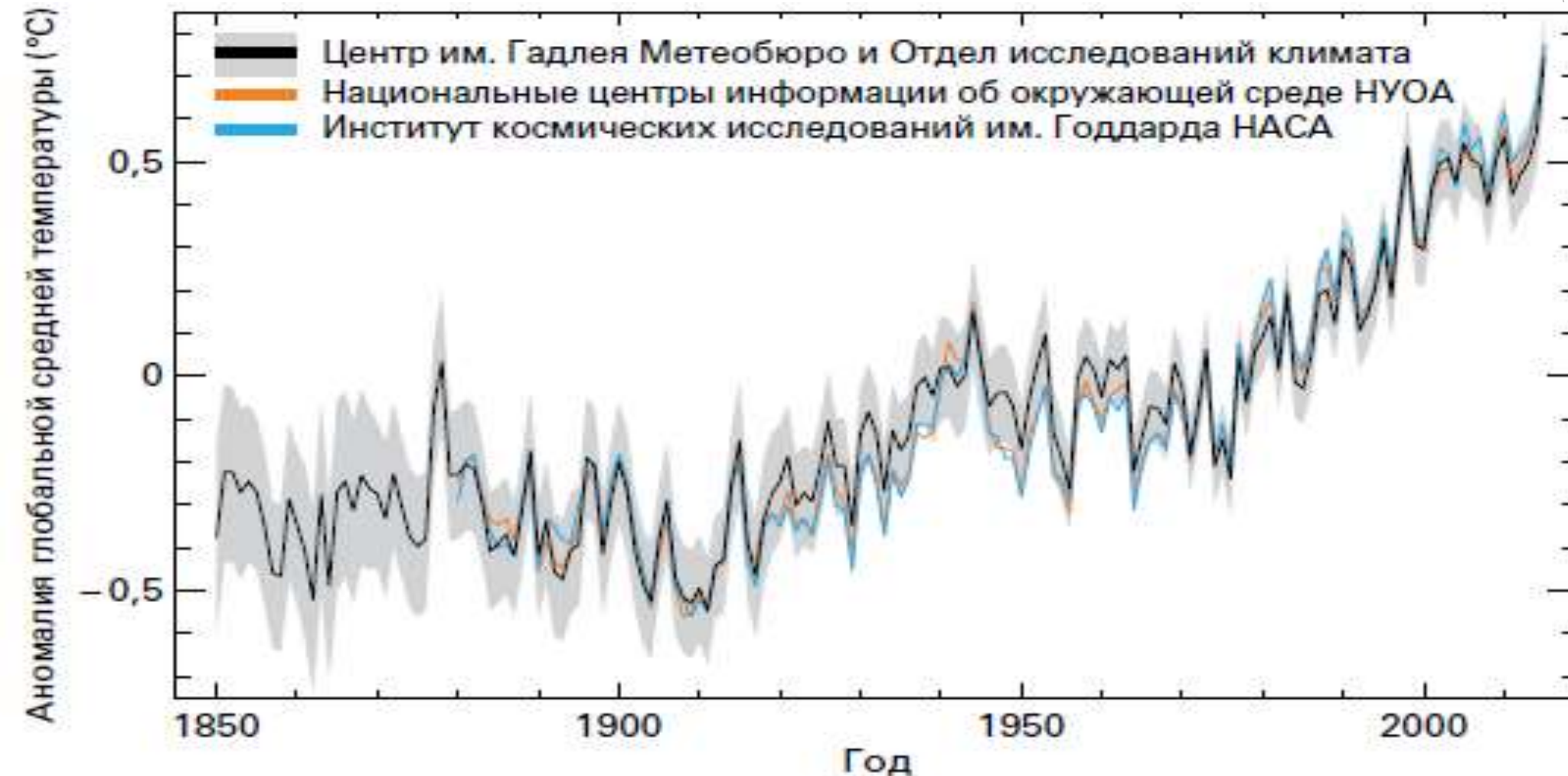


The red and orange zones are the boundaries of the melting glaciers

Melting glaciers in the Alps, 1909 and 2019



Annual anomalies of the global mean temperature from 1850 to 2014
according to the Hadley Center, UK (HadCRUT4, black line shows the average value, the gray area shows the 95% uncertainty range), the National Climatic Data Center (red line) and the Institute for Space Research. Goddard, USA. The anomalies are calculated relative to the base period 1961-1990. Source: WMO-No. 1167 WMO Statement on the Status of the Global Climate



FORWARD ESTIMATES - DIFFERENT SCENARIOS

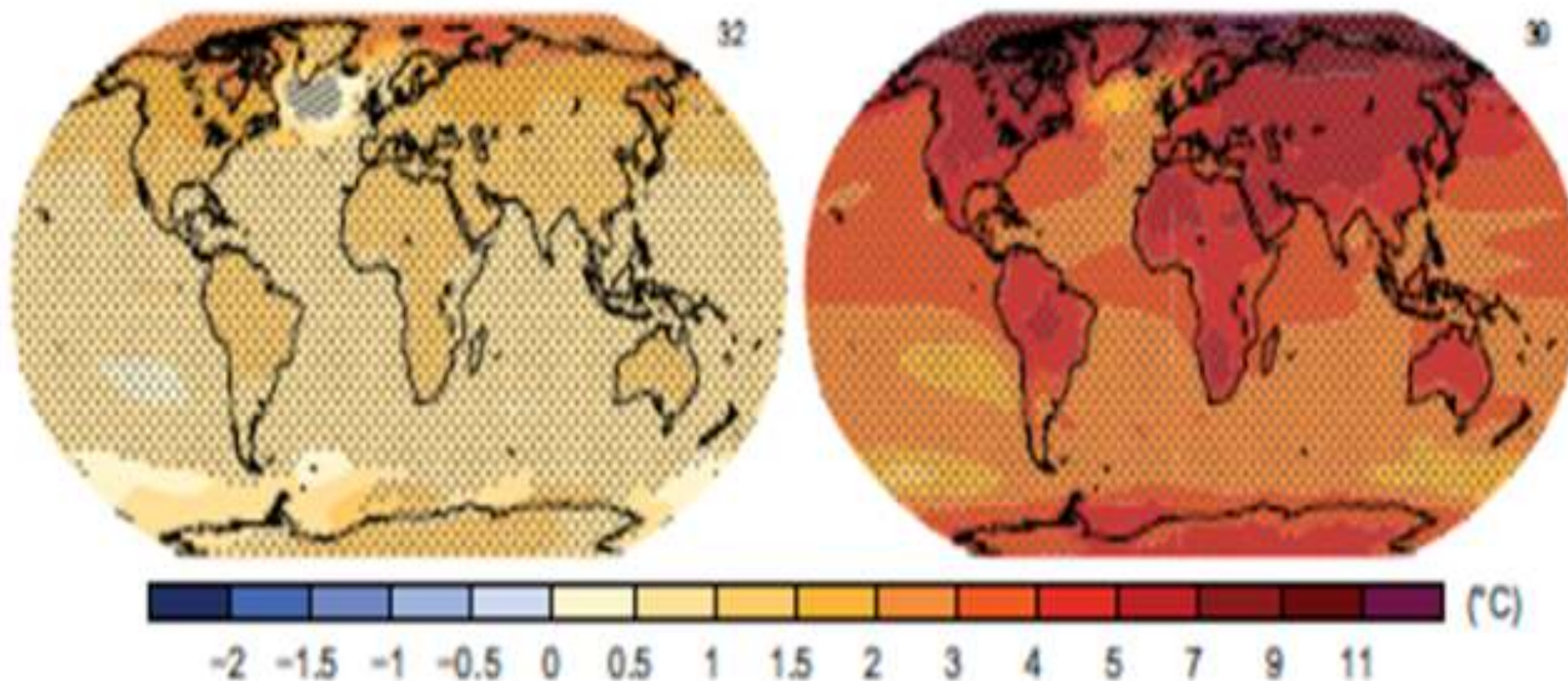
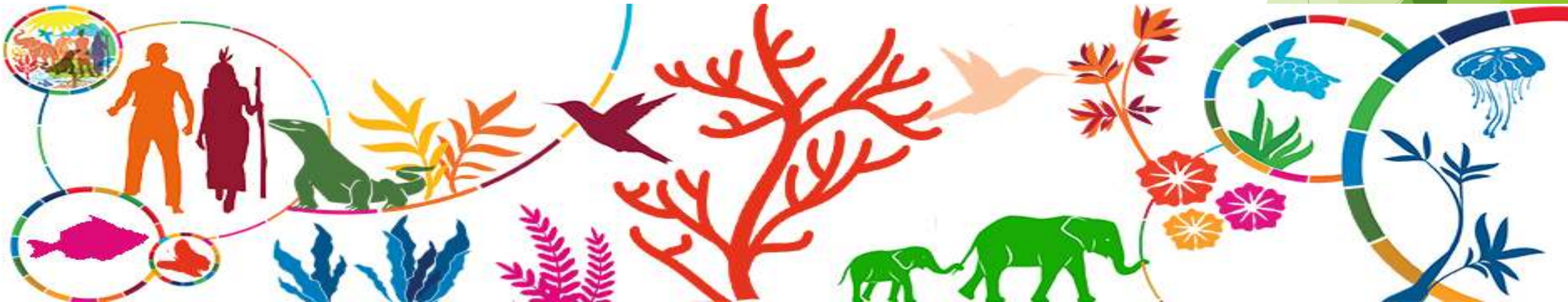


Рис.17. Изменение средней годовой приземной температуры, полученное по мультимодельному ансамблю моделей CMIP5 в рамках сценариев РТК2.6 (слева) и РТК8.5 (справа) для периода 2081–2100 гг. относительно периода 1986-2005 гг.,

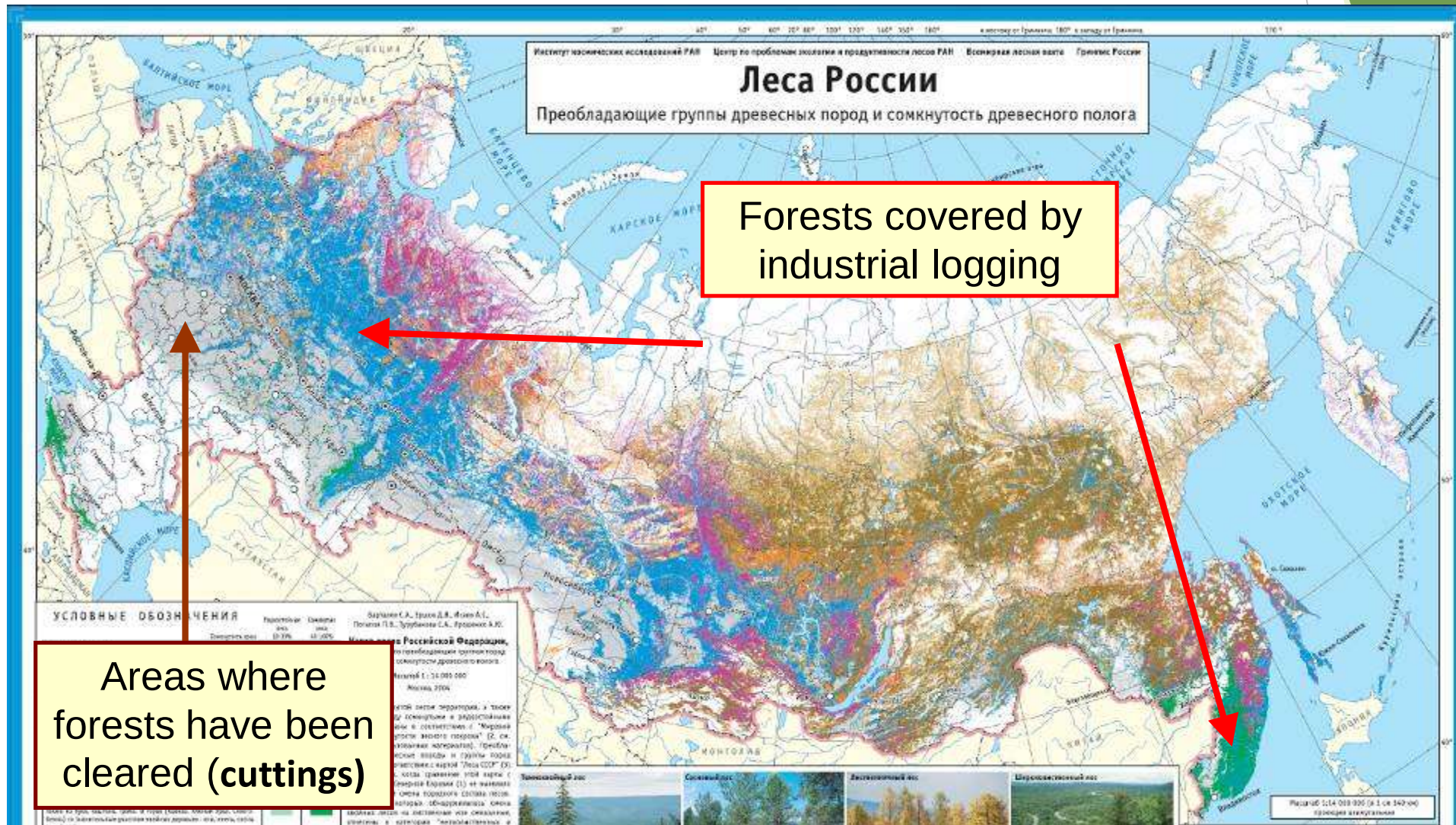
Источник: МГЭИК, 2013 г.: Резюме для политиков.

GLOBAL PROBLEMS

- ▶ *Reduction of forest area Associated with deforestation and environmental pollution*
- ▶ *Decreased biodiversity*
- ▶ *Associated with the destruction of species and their habitats, as well as environmental pollution*

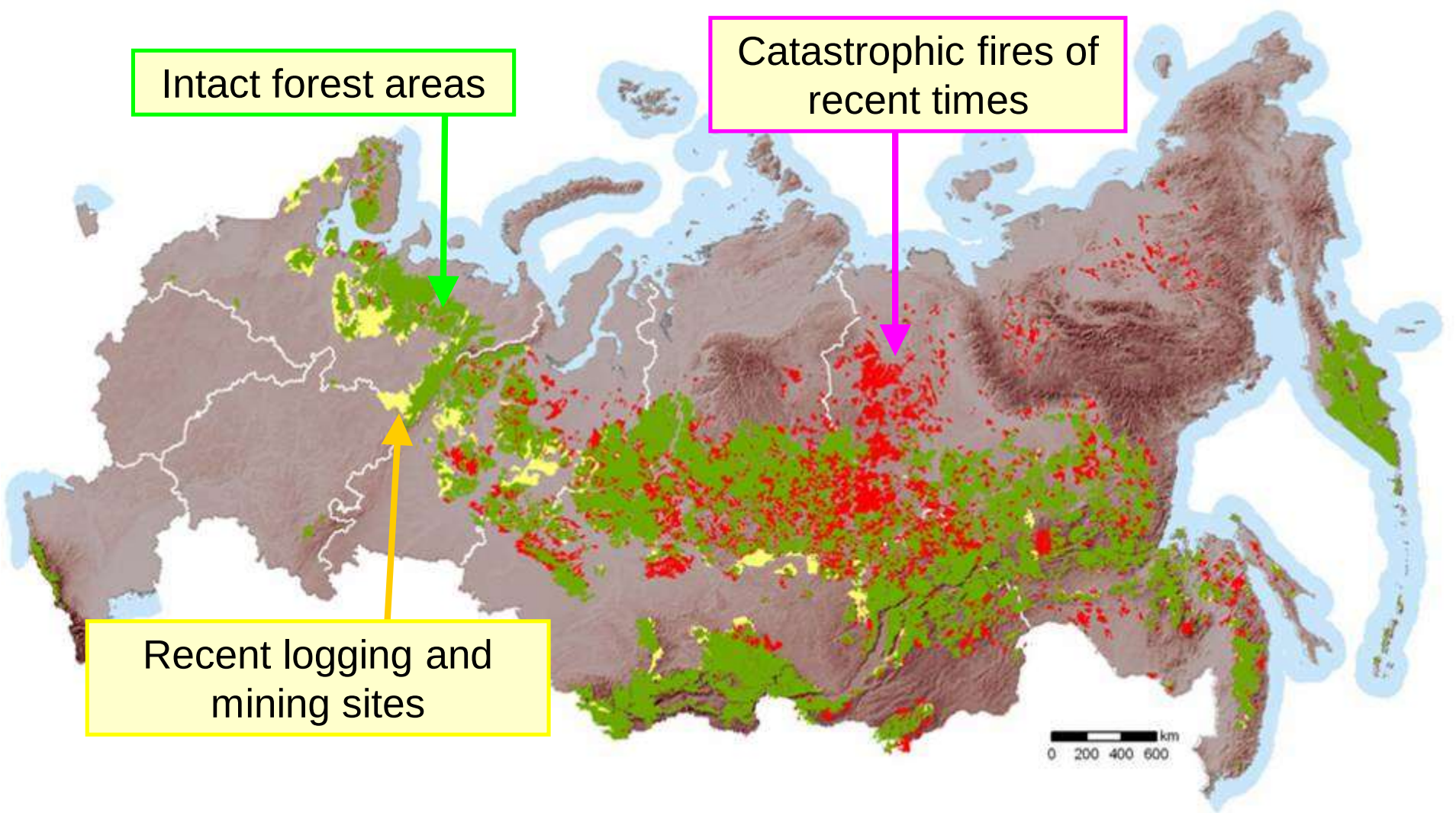


Space Research Institute, Center for Forest Ecology and Productivity,
Russian Forest Watch - 2017

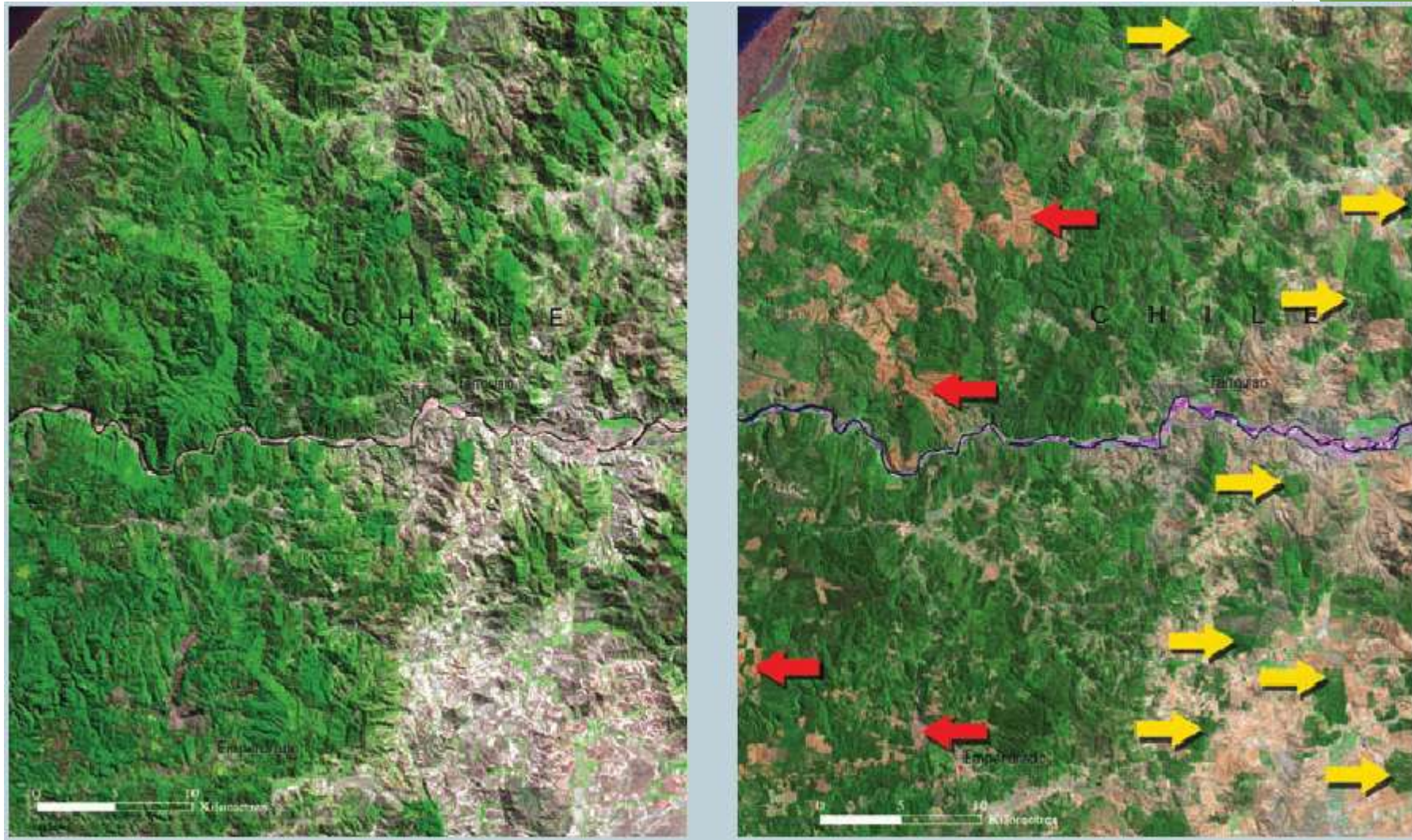


The impact of human economic activity on the forest landscapes of Russia over the past 10-20 years

Forest Watch of Russia, Center for Wildlife Conservation,
International Social and Ecological Union - 2014



The evolution of consciousness (Chile, 1975., 2015)



Red arrows - cuttings; Yellow arrows - plantings

- ▶ Forecasts of Organizations for Economic Cooperation and Development (OECD) show that with the current methods of production and consumption by 2050, in the near future, with the beginning of the 21st century, the world will lose two-thirds (from 61 to 72%) of flora and fauna, and the preservation of natural conditions will be irreversibly **damaged for 7.5 million sq. km** is an overview of the territory of Australia.
- ▶ According to the World Wide Fund for Nature report for 2010, the Living Planet Index (assesses the state of biodiversity) shows a drop of 30% compared to 1970, and the ecological footprint of humanity (human demand for natural resources) since 1966, on the contrary, has increased by almost 2 times. If our demands on the Planet continue to increase at the same rate, **by 2030 we will need the equivalent of two planets to sustain our way of life, and by 2050 we will need 2.8 planets.**

Currently, humanity is facing new global challenges such as:



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- The word cloud features the following terms:
- Food Security** (largest text)
 - Hunger**
 - Supply**
 - Availability**
 - Access**
 - Economic**
 - Uncertain**
 - Risky**
 - Inequality**
 - Poverty**
 - Disasters**
 - Climate Change**
 - Conflict**
 - Migration**
 - Urbanization**
 - Ruralization**
 - Agriculture**
 - People**
 - World**
 - Summit**
 - Needs**
 - States**
 - Limited**
 - United Nations**
 - Right**
 - Hunger**
 - Conferences**
 - Regulations**
 - Development**
 - Dependency**
 - Organizations**
 - Identified**
 - Recognized**
 - Unmet**
 - Vulnerable**
 - Disaster**
 - Climate**
 - Change**
 - Conflict**
 - Migration**
 - Urbanization**
 - Ruralization**
 - Agriculture**
 - People**
 - World**
 - Summit**
 - Needs**
 - States**
 - Limited**
 - United Nations**
 - Right**
 - Hunger**

The second challenge is an acute shortage of water

- ▶ The world's water resources are also under great pressure. Over the past 60 years, drinking water consumption has increased 8 times on the planet. By mid-century, many countries will be forced to import water.
- ▶ Water is an extremely limited resource, and the struggle for the possession of sources is already becoming a major factor in geopolitics, being one of the causes of tension and conflict on the Planet.
- ▶ The problem of water supply is also acute in our country. We lack quality drinking water. A number of regions are in dire need of it.
- ▶ There is also a geopolitical aspect to this problem. Already at the present time we are faced with a serious issue of using the water resources of transboundary rivers. Despite the complexity of this issue, we must not allow it to be politicized.



The third challenge is global energy security

- ▶ All developed countries are increasing investment in alternative and green energy technologies.
- ▶ By 2050, their use will allow generating up to 50% of all energy consumed.
- ▶ It is obvious that the era of the hydrocarbon economy is gradually coming to an end. A new era is coming, in which human life will be based not only and not so much on oil and gas, but on renewable energy sources.
- ▶ Kazakhstan is one of the key elements of global energy security.
- ▶ Our country, which has large world-class oil and gas reserves, will not step back from its policy of reliable strategic partnership and mutually beneficial international cooperation in the energy sector.



The fourth challenge is the exhaustibility of natural resources

- ▶ In the conditions of limited, exhaustible nature of the Earth's natural resources, an unprecedented growth in consumption in the history of mankind will fuel both negative and positive processes in different directions.

▶ Causes of Resource Depletion

- ▶ Human activity. Mining, manufacturing and industry, construction, industrial development, deforestation, drainage of water bodies, etc.
- ▶ Repopulation of the Earth. As a result, an increase in the rate of restoration of natural resources is given to the assessment of reliability.
- ▶ Excessive consumption. People tend to consume more, often much more.
- ▶ Environmental pollution. Leads to the destruction or renders unusable many resources.
- ▶ Natural causes. Various natural phenomena and processes can also lead to the loss of resources.
- ▶ **In Russia** - There will be enough oil for 35 years of development, gas for 81 years, coal for 60–180, iron ore for 42, niobium for 43, copper, nickel, molybdenum for 40, tungsten for 37, zinc for 18, lead - 15 years, antimony - 14 years, placer gold - 12 years, native gold - 37 years, phosphates - 52 years, potassium salts - 112 years.

<https://www.socionauki.ru/journal/articles/129898/>



Our country Republic of Kazakhstan has a number of advantages here - large reserves of natural resources

HISTORY OF ENVIRONMENTAL PROTECTION

► Club of Rome, Aurelio Peccei, 1968

- The Club of Rome is an international public organization (think tank) created by the Italian industrialist Aurelio Peccei (who became its first president) and the OECD Director General for Science Alexander King on April 6-7, 1968, uniting representatives of the world political, financial, cultural and scientific elite. The organization has made a significant contribution to the study of the prospects for the development of the biosphere and the promotion of the idea of harmonizing the relationship between man and nature.
- From the very beginning, the Club of Rome considered it one of its main tasks to attract the attention of the world community to global problems through its reports.

► "Limits to Growth" - first report to the Club of Rome, 1972

- "The Limits to Growth" is a report of the Club of Rome on the "Problems of Humanity" project, published in 1972. Contains simulation results of human population growth and natural resource depletion. The report was written by Donella Meadows, Dennis Meadows, Jorgen Randers and William W. Behrens III.
- The problem of overpopulation of the Earth was first raised by the Club of Rome 30 years ago. When I was a member of the Club of Rome, global problems were discussed there - the nuclear arms race, missile defense and others. Then it became clear: the main problem is the problem of human growth.
- Since the Earth's resources are limited, the authors set themselves the goal of determining the limits of the economic and demographic growth of human civilization in the face of gradually depleting natural resources. **The main purpose of creating the model was to mathematically calculate which behavior scenarios would be most typical for the world system as it approaches the limits of growth, as well as to find the most optimal (sustainable) scenarios for the development of mankind.**

"Limits to Growth" - first report to the Club of Rome, 1972 **RESULT TO 2100**

- ▶ The 1972 World model calculated 9 main variables:
 - ▶ non-renewable resources;
 - ▶ industrial capital;
 - ▶ agricultural capital;
 - ▶ service sector capital;
 - ▶ free land;
 - ▶ farmland;
 - ▶ urban and industrial land;
 - ▶ non-removable contaminants;
 - ▶ population.
- ▶ The main variables were interconnected by 16 non-linear differential equations, and more than 30 auxiliary variables and external parameters were involved in the calculations.
- ▶ In the 1972 book, the authors presented 12 scenarios for the development of mankind, including the basic model

HISTORY OF ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT IDEAS

- ▶ 1972 UN Environment Conference, Stockholm (Sweden), concerning the relationship between economic development and environmental degradation.
- ▶ In 1973, the United Nations Office for the Sudano-Sahel Region (UNSO) was established to lead efforts to combat the spread of desertification in West Africa. However, the decision-making process on this issue has progressed very slowly. In addition, the state of the environment was deteriorating, moreover, problems such as global warming, ozone depletion and water pollution were aggravated, and the rate of destruction of natural resources was accelerating.
- ▶ In the 1980s, negotiations took place among Member States on environmental issues, including negotiations on treaties to protect the ozone layer and control the movement of toxic waste.

HISTORY OF ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT IDEAS

- ▶ 1983 Establishment of the United Nations International Commission on Environment and Development UCED (Brundtland Commission)
United Nations Environment Program UNEP
www.unep.org
- ▶ 1986 ICED Report "Our Common Future"

CONCEPT OF SUSTAINABLE DEVELOPMENT – NEW PARADIGM OF WORLD DEVELOPMENT

The Rio de Janeiro Conference (June 1992) was the largest meeting of heads of state and government in history, which adopted an agreement developed by 179 states, the **Program of Action (“Agenda for the 21st Century”)**, – representing the project of economically, socially and environmentally sustainable development of the world community.



In essence, this program of work for the next century, a worldwide cooperation program aimed at the harmonious achievement of two goals - a **HIGH QUALITY ENVIRONMENT** and a **HEALTHY ECONOMY** for all the peoples of the world.

Paths of Ultimate Integration... Path of Gro Harlem Brundtland



Гру Харлем Брундтланд, бывшая в то время премьер-министром Норвегии, выступление перед Генеральной Ассамблеей ООН в 1987 году. Взаимосвязь между окружающей средой и человеческим обществом является общей нитью, которая проходит через весь Доклад Комиссии Брундтланд и Оценочный доклад ГЕО-4. Источник: UN Photo

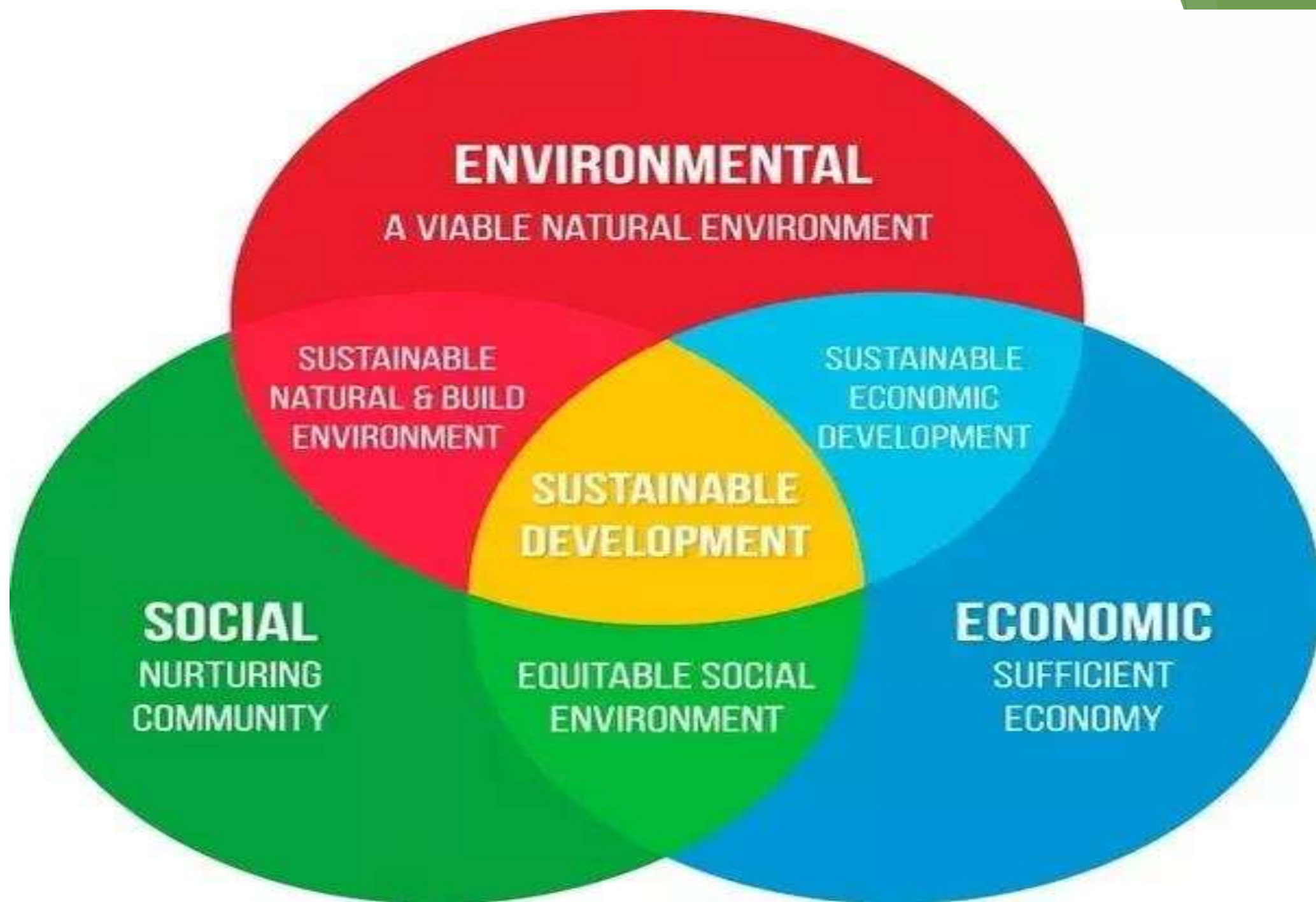
June 3-14, 1992 UN Conference in Rio de Janeiro Environment and Development

Main documents

- ❖ **The Rio Declaration on Environment and Development**, which stated that "to achieve sustainable development, the protection of the environment must be an integral part of the development process and cannot be considered in isolation from it." The Declaration includes 27 principles that define the rights and obligations of countries in ensuring the development and well-being of people. June 5 is International Day for Conservation of Nature.
- ❖ **Statement of Principles for the Global Consensus for the Management, Conservation and Sustainable Development of All Types of Forests**
- ❖ **Agenda 21** - a program on how to make development socially, economically and environmentally sustainable. An important theme of Agenda 21 is the need to end poverty by giving the poor greater access to the resources they need to live sustainably
<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm>



- ▶ The United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, defined the basic principles and program of action in order to achieve sustainable development.
- ▶ **DEFINITION**
- ▶ **SUSTAINABLE DEVELOPMENT, ALSO HARMONIOUS DEVELOPMENT, BALANCED DEVELOPMENT** - the process of economic and social change, environmental resources, investment direction, scientific and technological development orientation, personal development and institutional changes are coordinated with each other and offer the present and future potential for rich patterns and aspirations.
- ▶ **SUSTAINABLE DEVELOPMENT** - **meeting the needs of the present generation without compromising the ability of future generations to meet their own needs**
- ▶ These efforts will also promote the integration of the three pillars of sustainable development - **economic growth, social development and environmental protection** - as complementary and mutually reinforcing elements (Principle 7 of the Rio Conference).
- ▶ The main objectives and basic requirements of sustainable development are the eradication of poverty, the change of unsustainable patterns of production and consumption, and the protection and rational use of the natural resource base of economic and social development.



After P10-92

- ▶ From August 26 to September 4, 2002, the **World Summit on Sustainable Development** was held in **Johannesburg (South Africa)**, which helped to **assess the achievements, changes and new challenges since the 1992 Earth Summit.**
- ▶ **This SUMMIT has translated the goals, promises and commitments of Agenda 21 into concrete, practical actions.**
- ▶ **IN JUNE 2012, 20 YEARS AFTER THE ENVIRONMENT AND DEVELOPMENT CONFERENCE IN RIO DE JANEIRO, COUNTRIES MET AGAIN AT THE RIO + 20 SUMMIT, WHERE THEY DISCUSSED THE EMERGING ISSUES OF A GREEN ECONOMY, SUSTAINABLE DEVELOPMENT AND POVERTY ERADICATION.**



RIO+20
United Nations
Conference on
Sustainable
Development

Thank you for Attention!

