This project is funded by the European Union

Project is implemented by CAREC in cooperation with IUCN

All the above factors in their totality produce an effect upon the growth and change in the structure of consumption of the water, energy and food resources. Moreover, they simultaneously increase the load upon the natural environment, reducing its self-restoring capacity.

The latest Report of the World Economic Forum on Global Risks[4] has shown the water, food and environmental crises as part of the top 10 risks, by the extent of their impact on the sustainable development of the countries. The issue of inter-sector coordination of the management of these risks lies in an authentically systemic problem. Despite the fact that the connection between water, energy, food and ecosystems is universally recognized, the integrated vision thereof has not been sufficiently studied. Case studies, methodologies and tools, which assess the synergy of sectors in their totality, are of particular importance in the context of investing into the developing economies, which shall finally make it possible to define the framework for making decisions for politicians, business leaders, investors, non-governmental organizations and the public at large.

The next paper will reveal the results of some studies and assessments of the water-energy-food interconnections, carried out at the global level.

[4] The Global Risks Report 2018, 13th Edition, the World Economic Forum, 2018

CONTACT INFORMATION:

www.carececo.org

Facebook - www.facebook.com/carececo/

Twitter - @recca_carec

#CAREC #CAREC_news (#Nexus#NexusCentralAsia)

Author: **Saltanat Zhakenova**
The Regional Environmental Centre for Central Asia
szhakenova@carececo.org

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the author Saltanat Zhakenova and CAREC implementing the «Central Asia Nexus Dialogue project: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-Sector Investment» Project and do not necessarily reflect the views of the European Union.

This project is funded by the European Union

Project is implemented by CAREC in cooperation with IUCN

CENTRAL ASIA NEXUS DIALOGUE PROJECT: FOSTERING WATER, ENERGY AND FOOD SECURITY NEXUS DIALOGUE AND MULTI-SECTOR INVESTMENT

From a series of papers on the Nexus approach to achieving water, energy, food and environmental security in the Central Asia

The summary of the first paper "The Nexus Approach: Background"

Beginning from the last third of the 20th century the scientists and practitioners started to consider the so-called Nexus approach as an approach of interconnection between the water, energy and food sectors. An inter-sector approach is based on a mutually beneficial compromise in the process of decision-making for the development of the sectors. The approach has been documented for the first time in the context of the Principles of Integrated Management of Water Resources. The Sustainable Development Goals (SDG), approved by the UN in September 2015, have provided an additional impetus to understanding the Nexus for ensuring water (Goal 6), energy (Goal 7) and food (Goal 2) security.

The second paper "The Essence of the Nexus Approach in the Context of Global Risks"

Since the First International Conference, held in Germany in the year 2011, which has drawn attention of the economic community to the importance of using the Nexus approach in planning the governmental strategic policy, a number of case studies have been conducted. In spite of the fact that at different times such additional components as ecosystems, climate, land use, etc. have been taken into account in various studies, the general interconnections between the originally determined water, energy and food supplying processes, have remained practically unchanged (Fig. 1).

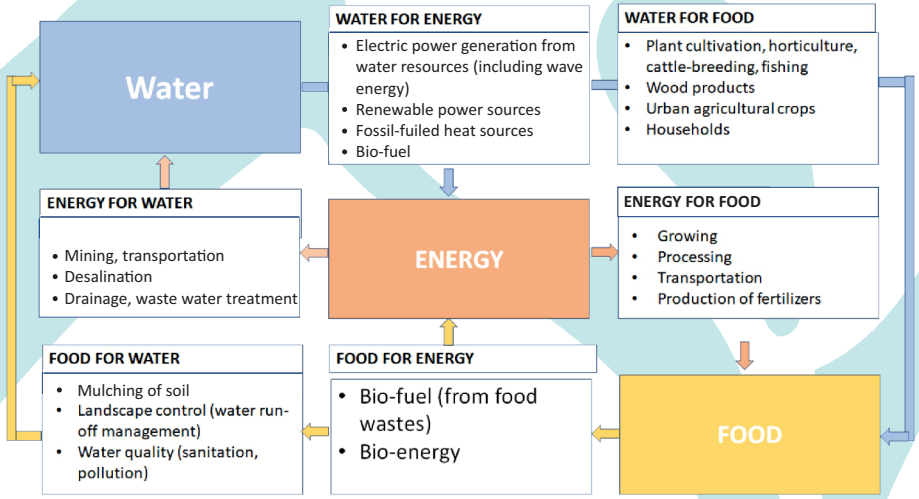

Fig. 1. Direct interconnections between water, energy and food.

The growing interest in the analysis of interrelations and information for making effective inter-sector decisions to ensure water, energy and food security gives rise to several major factors of global significance:

1. Economic growth

The main economic indicators testify to the fact that the world economy has finally recovered after the global crisis, which broke out 10 years ago. It is expected that the growth of global GDP in the years 2018 and 2019 shall make up 4.0 and 3.9 percent, respectively.[1]

2. Population growth

In the midyear 2017, the world population has made up almost 7.6 billion people. This means that over the past twelve years, the indicator has increased approximately by one billion. According to the forecasts, by the year 2100 the population shall increase by 47% in relation to the level of the year 2017, and shall be equal to 11.2 billion people.[2] (Fig. 2)

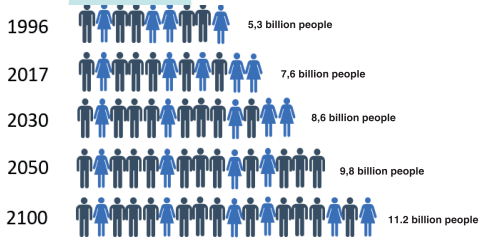

Fig. 2. Population forecast.
Source: prepared by the author on the basis of the materials of World Population Prospects - 2017 Revision: Global population, UNDESA

3. Urbanization

Despite the fact that with the beginning of this century the growth rate of the urban population slowed down, the tendency of global urbanization has not changed (Fig. 3). So, in the year 1950, 70% of people around the world lived in rural areas, and less than 30% - in cities. In the year 2014 the urban residents have made up 54% of the world population. It is expected that by the year 2050 a third of the world population shall live in rural areas, and two thirds - in cities.

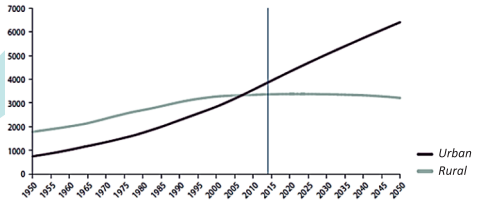

Fig. 3. Urban and rural population, 1950-2050.
Source: World Population Prospects – 2017 Revision: Global population, UNDESA

[1] 2018 Global Economic Outlook: As Good As It Gets, Goldman Sachs, 2017
[2] World Population Prospects – 2017 Revision: Global Population, UNDESA, 2017

4. Climate change

According to the latest Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in 2000-2010 an average annual increase in the concentration of greenhouse gases in the atmosphere has made up 2.2%, whereas during the period of 1970-2000 it was equal to 1.3%.[3] (Fig. 4)

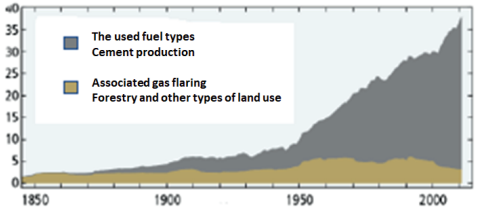

Fig. 4. Global man-made emissions of greenhouse gases (equivalent to CO2). Source: The Fifth Assessment Report (AR5), IPCC, 2014

Global man-made emissions of greenhouse gases are the main indicator for assessing the impact of human economic activity upon the climate change processes. Accordingly, the "chain" of climate vulnerability, associated with an increase of this indicator, has begun with the change of natural and anthropogenic systems on all continents and oceans. This has resulted in the changes of the hydrological systems, affecting the water resources in terms of their quantity and quality (Fig. 5). Subsequently, many species of flora and fauna have changed their geographic regions, seasonal activity, nature of migration, as well as their number and interaction with other species. With regard to the development of agriculture, positive changes in crop yields, connected with an increase in the surface temperature, have been observed in some areas of the Earth. (Fig. 6). At the same time, negative impacts have proved to be more common.

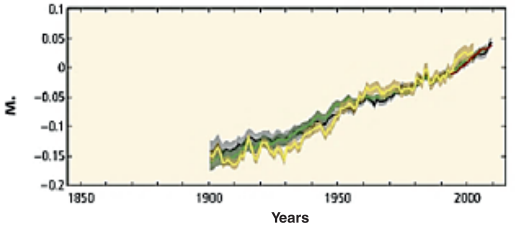

Fig. 5. Global-averaged changes in the level of the world's oceans. Source: The Fifth Assessment Report (AR5), IPCCC, 2014

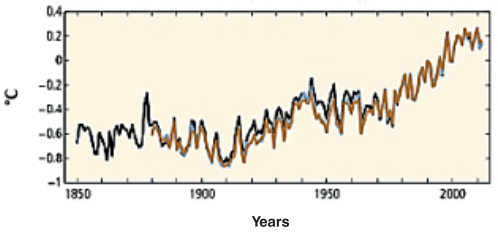

Fig. 6. Global-averaged combined temperature anomalies of the Earth surface and ocean.
Source: The Fifth Assessment Report (AR5), IPCCC, 2014

[3] The Fifth Assessment Report IPCC, WMO, UNEP, 2014