

## WORLD ECONOMY AND INTERNATIONAL ECONOMIC RELATIONS

### ECONOMIC TRANSFORMATIONS IN AGRICULTURE UNDER THE INFLUENCE OF CLIMATE CHANGE EFFECTS

**Kyryziuk S.V.**

Candidate of Economic Sciences,  
Senior Research Scholar at Department of Economy  
and Policy of Agrarian Transformations,  
Institute for Economics and Forecasting  
of the National Academy of Sciences of Ukraine

Since the beginning of XXI century, climate change is increasingly raising the risk of losses in agriculture (over a shortfall of planned harvests). In the highly globalized world it leads to failure of market laws by the fluctuations in the world agro-food prices. It is a rather complicated scientific problem to identify and confirm the linkages between global climate change and fluctuations of economic parameters, since it requires the integration of at least three different models: climate, plant growth and economic.

In this study, we tried to summarize the nexus and changes in the agricultural component of the economy under the impacts of climate change.

It is considered that in the medium term (by 2050) under the maintaining the current trends of greenhouse gases emissions there will be dominated the negative effects of climate change on agriculture. In this case, more sensitive economic parameters of the agriculture to climate change are the world agro-food prices, productivity (yields), crop area and production levels, and less sensitive – consumption and international trade.

The shortfall of potential (without climate change) crop yields and increasing global food demand will affect the equilibrium of the market prices towards their increases. This will create incentives for farmers, which try to compensate for the loss of productivity

by improving technology and management systems, and the expansion of areas under the commercial (with the highest prices) crops. Within the climate change by 2050, some part of arable land will become unfit for production use: mainly, in the developed countries (21-32 million ha according to the different socio-economic scenarios), and also in the some middle-income developing countries, like China, India, Russia etc. (up to 32 million ha under the worst scenario). These land losses could be compensated by the plowing up new areas in the equatorial Africa and Brazil. This may create additional environmental risks, increasing the negative contribution of agriculture to climate change.

However, despite the impact of climate change, the world production of major crops in 2050 according to the modelling results will grow by 30% compared to 2010. Most of the benefits of climate change will be distributed among the developing countries, while the developed ones will lose their share in the world production. As a result, within the climate change there will be a gradual geographical relocation of the world centres of production and consumption of agricultural products. It will affect the vectors and the absolute volume of world trade flows, although the relative world trade index (compare to the output) won't change significantly.