Climate change and rural development (cultural heritage in a new age)

Rudnev Viacheslav

Modern society sensing an influence of different circumstances includes economic, social and environmental requirements. Climate change has an important influence on specificity of rural development in Eurasian area. A history of transformations in using a landscape by humans is difficult, because such history depends on social-cultural factors and local changes in climate and environment. A business in rural sector usually respond acuteness on all of these factors. That has determined special attention to this topic.

Extremely hot weather became an especially important factor for society, life and business in the last few decades in the Eurasian area. Extremely hot summer period in West and South Europe and in a Central part of European Russia caused a lot of local human' health problems and problems in agricultural business. A history of local landscape-using includes many facts that document extremely hot periods in these areas in the past.

In 2010 an extremely hot summer period in a Central part of European Russia caused a fire in peat areas and a bad harvest for potatoes and cereals. Forest fire covered more than ten million hectares in an area of European Russia and temperature set a record (38.2 degrees Celsius) on 29 July 2010. A lot of fires in peat areas were a result of drainage of a peat-bog, after finishing a process of peat extraction. A history of local landscape using includes many facts that document extremely hot periods in this area in the past (for instance, in 1972 and 2003). Irregular extremal weather conditions stimulated investigations by meteorologists and historians on analyses a mode for prediction an extremal weather conditions.

The history of meteorological observations in Russia and the Russian chronicles kept extensive data about weather anomalies in the European part of Russia in the past. According to the chronicles, negative weather conditions during 1000 years (from 10^{th} till the 19^{th} century) were the cause of 350 hungry years. Both cold weather and rains, and droughts had negative influences. Quite often un favourable conditions were tightened for many years. So, the period of the increased humidity and cold weather (1601-1603) was framed as a period of "great hunger". Quite often the periods of the high humidity were changed by years from a drought. For example, 1785-1786 years were rainy, but since 1795, there has been a drought. Specifically, weather conditions often distinguished as "motley": in 1821 a crop in provinces of the Central part of Russia suffered from rains and cold weather, but in the southern part of the region there was a drought. However, inauspicious weather conditions in one region was "compensated" quite often by favorable weather in other region. For example, the abnormal heat of 2010 in the European part of Russia didn't extend to the east. In Siberia there were favorable conditions for landowners.

Unstable weather conditions have stimulated always a special attention of businesses that were not agricultural especially employment. Now, in the European part of Russia, there is a process of development both non-agricultural sectors of business, which are searching for new agrarian technologies for landowners . The hope is that these will minimize the dependence on inauspicious environmental conditions. Grow agriculture's capability to develop in difficult weather conditions is one of the solution to problems of agro businesses in areas of risky agriculture.

Analysis of data derived from keeping metrics allow researchers to recommend diversification in landscape-using (in particularly expansion of non-agricultural businesses, and also eco-protection activity as prospective keys for reducing risks for businesses in a local landscape including the realization for developing a model of Sustainable Development for local areas.
Actually, climatic changes are connected not only with the variety and technologies of the cultivated crops, but also with protection from agricultural pests. Populations of agricultural vermin will be present after the warm winters and create a negative influence on the cultivated cultural plants. There will be new emergence (for this region) possible agricultural diseases. Also growth of intensity of distribution of weeds is possible. The hot summer in the Volga-river region promoted increase in a contamination of fields weeds (a sonchus pink).

Today we find a broadening of area suitable for agriculture in Northern part of Russia. This stimulates processes on diversification of economy in these regions in Russia. In the middle of the 20th century, projects on development of agriculture in northern areas were actively developed. The Institute of Polar Agriculture coordinated researches on the territory of the North. Potatoes and cabbage were successfully adapted to the northern climate conditions. Good harvests of potatoes were grown up on the 66th parallel.

The hot summer of 2010 negatively affected the grain yield and potatoes in the Volga-river region. Meanwhile, production of meat and eggs was successful in this region. Actually, diversification of a business activity is a main way for achieving success on neutralization problems of local climate changes. Situation in West Africa area in 20th century and other areas of the World can to confirm this thesis.

Modern scholars are sure that process of climate changes is a very complicated phenomenon. Many scientists are sure that decarbonization has an important role in process of minimization risks of climate changes. If temperatures rise by more than 4 degree Celsius, the consequences are absolutely terrifying: glaciers will disappear, soil moisture will be lost , rainfall will decline in many regions, and extreme events such as massive heat waves, droughts, floods, and extreme tropical cyclones, will all become far more frequent.

If temperature increases of 5 degree Celsius or more, the ensuing sea level rise would threaten many cities (London, New York, Tokyo). Calamitous events are possible with a mega-rise in sea levels. If the big ice sheets in Antarctica and Greenland break up into the ocean, the sea level will rise by many meters.

Modern studies show that many counties around the world in the period 2080-2099 will have problems on growing food. Areas near the equator have a tendency toward drought. Areas in South Asia, tropical Africa, Latin America and Australia will loss in food productivity. As the Ocean becomes more acidic, many classes of flora and fauna (shellfish, crabs, plankton and coral reefs) will dying-off. Mainly, there are two different ways of responding on climate change: mitigation (reduce the greenhouse gas) and adaptation (including protecting crops from high temperatures and droughts, redesigning agricultural technologies to promote more drought resistance).

Climate is important determining factor of rural economy. Different models of relationships between Nature and Society provide perspectives for seeking the way for solutions to actual current problems in human health, business and other spheres.

Modern experts conclude that society can steer two basic strategies with respect to global warming: minimizing its negative effects, and adaptation to it. Modern society try working in both directions. Many specialists in agriculture sure that in the case of climate warming it will be necessary to change the sowing time or to choose other plants. It may be useful to change technologies of crop rotation.

Agribusiness is a typically risk sphere. Farmers facing many different types of risk including price risk, yield risk and so on. Strategies for adopting risk-reducing technologies are numerous and diversification activity is one of the main. Diversification of crops that the farmer produces may be an effective instrument to help farmers deal with several types of risk (including price and yield risk, influence of weather factor). Using diversification, farmers can to choose a combination of crops with different characteristics (minimize the risk / influence of seasonal climate variety).

Diversification of agriculture (in context of climate-change reality) is an important strategy for transformation practices and strategies in agro-technology, crop rotations, mixed cropping and landscape using. Improvements in agricultural systems through diversification strategies offer the potential to mitigate a risk of a climate change.