



Landscape and business risks: History and climate (Rural Russia)

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Abstract

Aim: This study aimed to ascertain the potential risks associated with a given landscape within the context of the influence of a given climate. Information about the local climate and how the land has been used throughout history is emphasized. In the last few decades, extremely hot weather has become a significant factor in Eurasian society, life, and business. In 2010, an abnormally hot summer in the center of European Russia led to a fire in peat areas and a poor harvest of potatoes and cereals. On July 29th, 2010, a record-breaking heat wave (38.2 degrees Celsius) and massive forest fires ravaged millions of acres in European Russia.

Method: A qualitative method was employed to accomplish the goal. Secondary resources were used to compile the data.

Findings: The findings demonstrate that current academics expect civilization to usher in two concrete responses to global warming. The two-way street is contemporary culture. There is widespread agreement among agricultural experts that a shift in the seed-planting window or the selection of alternative crops will be necessary if the planet's average temperature rises. The use of new crop rotation methods could be beneficial.

Implications/Novel Contribution: Since it depends on social and cultural conditions, the local ecosystem, and environmental changes, writing a history of human landscape change is challenging. Businesses operating in rural areas usually respond appropriately to all these factors. There has been a lot of focus on this.

Keywords: Sustainability, Nature using, Business, Climate, Risks

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INTRODUCTION

Businesses and society in modern business are incredibly reliant on Mother Nature, which presents several challenges. Any disruption to the standard climate model can have far-reaching consequences for the business world and society. Alterations to the global climate cause a domino effect of adverse weather conditions. The Intergovernmental Panel on Climate Change (IPCC) found that extreme weather events were more frequent, intense, spatially dimensional, long-lasting, and cyclical after implementing human-caused climate change. Climate change on a global scale has the potential to amplify the effects of disasters (of a meteorological character). Large swings in weather (such as those caused by hurricanes) inevitably disrupt national economies. Record heat was experienced in Australia, Argentina, and New Zealand; cold weather was active in the southeast of the United States and Europe; snowfalls were experienced in Israel, Jordan, and Syria; droughts dominated in Angola, Botswana, Namibia, the northeast of Brazil, and the south of China; floods were experienced in India, Nepal, and the northeast of China (Abdullah et al., 2015; Ieke, Rostiena, Abdullah, & Mulyaningsih, 2019; Richardson, 2007).

In 2010, an extremely hot summer in the central region of European Russia led to numerous health issues for local residents and disruptions in the agricultural business. Attempts to reduce potential risks are a pressing issue in modern society. A better understanding of a particular problem and the development of the best possible business projects for the future will necessitate interdisciplinary research, and a focus on the history of local climate changes (Dong & Keshavjee, 2016; Kongmanus, 2016; Rudnev, 1997).

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LITERATURE REVIEW

In 2010, the Central part of European Russia had an extremely hot summer period. During two months hot weather stay in the area and the temperature set a record of 38.2 degrees Celsius on 29 July 2010. The abnormal heat led to the mass forest fires which were especially menacing to the peat fires in the Moscow area. The woods burned in many regions and created a very difficult situation with the fires in the Nizhny Novgorod, Voronezh and Ryazan areas. The total area which burned as a result of the natural fires in 2010 exceeded 10,7 million hectares (according to the Global Fire Monitoring Center). A lot of people suffered. More than 1200 houses were destroyed, 127 settlements suffered from forest fires.

This was an extraordinary situation for July-August. These areas attracted special attention by specialists in Meteorology and Geophysics. Interdisciplinary collaboration of specialists in the science of Nature gave a positive view for the understanding of the situation which helped to make things clear. Hot air from the South was involved into the ozone anomaly above the region. It was a cause of the heat. The southern anti-cyclones (bearing the heated air) were pulled into a small ozone anomaly. The ozone hole held an anti-cyclone constant and "absorbed" air from the South for nearly two months. On August 20, 2010 ozone anomaly was closed and became cold in the area. On August 22, the cold air spread over the region, including the Lower Volga (Fadwa, 2018; Syvorotkin, 2010; Yahya, Ismail, Salleh, & Abdullah, 2015).

This situation had a negative influence on many businesses including many farmers who had a bad harvest of potatoes and cereals.

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 10th till the 19th century) were the cause of 350 hungry years (Borisenkov & Paseckii, 1988). Both cold weather and rains, and droughts had negative influences. Quite often unfavourable 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 (Borisenkov & Paseckii, 1988). 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 agricultures capability to develop in difficult weather conditions is one of the solution to problems of agro businesses in areas of risky agriculture.

METHODOLOGY

Astronaut Alexander Gerst (working on the International Sky lab) made photos of Central Europe and Germany in the beginning of August 2018 .These photos were shocking: formerly the landscape was green and now it is brown (See Figure 1). Soils have dried up. Astronaut Gerst noted: It looks like a mixture of dust, smoke and sand. Many scholars, businessmen and citizens have a question now about the future of these landscapes. They ask: Is it a new stage in a local climate model or it is only a non-permanent event? An answer on this question (and forecast in a period of nervous climate) is difficult both for Meteorological science (Richardson, 2007) and for Folk Meteorology (Rudnev, 1997). Climate, climate change is important factor of Human existence and has active role in concept of Sustainable Development. The problems of ecology have provoked the initiative of the United Nations Conference on Environment and Development of Rio de Janeiro, 1992 which focused on the necessity of solutions for the problems of the relationships between Nature and Society as a key to Sustainable Development (the key to harmony in relationships between Human, Nature and Society). The main principle of a strategy to

achieve sustainable development is development today must not threaten the needs of present and future generations. Actually, our world (the crops we grow, the cities we live, the technologies that we use and so on) is based on a climate conditions well-known to us. The functioning of the ecosystems, the biodiversity are limit by climate model.

RESULTS AND DISCUSSION

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 from Murmansk city to Anadyr city. 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 Sahel (West Africa) area in 20th century can to confirm this theses.

A long period of droughts in West African Sahel (1970s and 1980s) led to environmental stress in the area. The environmental stress has forced some pastoralists (Fulbe people) to leave the area (and traditional mode of life). A impoverished Fulbe seek new opportunities in the urban economy as sedentary farmers (mainly in the domain of animal husbandry). They had a hope that later they would return to the pastoral mode of life. However that returning was impossible. That was a process in which Fulbe dependency on a natural resources decreases and increases their dependency on non-pastoral people and strange mode of life. A new social relations became important to Fulbe. Many groups of Fulbe had to develop a new identity. Now Fulbe claim their identity as strangers (De Bruijn, 2000).

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 (Sachs, 2015). Professor Jeffrey D. Sachs dedicated a chapter in his book on The age of Sustainable Development to this problem.

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.

Increasingly energy use gives the potential for increasing environmental change, and through climate changes may result from the building up of greenhouse gases in the atmosphere there is the likelihood that soils and land forming processes will be modified to a substantial degree.

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. 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).

Agro-ecological history offers a long-term perspective for the main questions of sustainable development.

Comparative material theoretical frameworks are actual for studying this topic. One of the main drivers of change in atmosphere is using coal, oil and natural gas. Using a coal, oil and gas to move cars, heat buildings, producing steel, cement, electricity accompanied by producing a carbonic acid, that is emitted into atmosphere. Many scholars are sure that the rising concentration of carbonic acid in the atmosphere is one of the main factor of human-induced climate change.

Climatologists have shown that whenever an atmospheric concentration of a carbonic acid was high, the climate tended to be warm, but whenever a carbonic acid was low, the climate tended to be cold. Now the level of a carbonic acid in atmosphere is higher than at any time in the period of past 800 000 years. It is danger for our industry and agro sphere; the sea level will be much higher.

A report on climate change by Lord Stern (known as the Stern Review of Climate Change) shows that higher concentration of carbonic acid in atmosphere will bring a higher increase of the temperature. A global temperature increase will bring changes in many spheres (temperature raised by around 3 degree will bring risks in providing with a food and water, temperature increase around 4 degree will bring catastrophic potential changes in many areas). Whenever the Earths atmosphere was a few degrees warmer than now, the ice sheets retreated and sea levels were several meters higher than now. A temperature increases of around 5 degree will bring a rise of sea level danger for a lot of cities.

For many meteorological phenomena there are no reliable forecast models available. That means that no mathematical models can provide a climate forecast. Meteorology faces with social expectations. 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.

If the world economy will continues to base on using hydrocarbon as today the greenhouse gases concentration in the atmosphere continues to rise rapidly. It is danger and dramatic scenarios for humanity. The alternative is to use solar power for replace coal-fired electricity generation and new technologies friendly to nature. Sustainable development goals including social and environmental sustainability. It is complicated goal but actual for humankind.

Effective strategy of Global activity for protect biodiversity will play a vital role in the process of adaptation human economy to a process of climate change. Climate change is extraordinarily difficult process especially in context of a rapid urbanizing world, increasing population, overexploitation of oceans and land resources. These are complex problems. Now we could only hope that things will change for a better and teams of researchers involved in interdisciplinary studies will gain more support from society.

CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

Modern scholars are sure that climate change is a serious and real problem. Every area has exceptional problems in this sphere and local experience in solutions of this problem has a special value for mankind. Experts predict growth of frequency and intensity of cyclones, thunder-storms, floods and droughts. Perhaps a change of temperature and amount of annual precipitation will have an effect on seasonality, in particular, in agrarian production. Climatologists assume that climatic changes will stimulate a reduction of the area suitable for agriculture in Africa and broadening such areas in the northern hemisphere. 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 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).

Unusual sort of weather is important fact of vulnerability for farmer economy in many areas. Extreme

weather events are becoming more common now in different areas. Quite often, the risks of cardinal change of local model of climate stimulating demographic change, socio-economic conditions, and activity of local institutions (sometimes an outlook of local model of sustainable development is at risk). Now seasonal climate forecasts active involved into farmers management processes, and organically linked with environmental, agronomic, social, political and economic spheres. A quality seasonal climate forecasts can assist to farmers in choosing their farming strategies for minimize risks of economic failures. The integration of new information about climate change scenarios into agricultural management practices has a special value for now.



Figure 1. Areal overview

Diversification of agriculture (in context of climate-change reality) is a key 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 climate risk. Modern agribusiness has demonstrate a tendency of transition from the idea of producing commodities to producing differentiated products with some special attributes (such as local, pesticide-free, organic) that are useful for business.

Throughout history, agro climatic factors have contributed much to diversification and specialization of agricultural production. So, a lot of regions concentrated on the production of a few key products (wheat, rice, maize) together with some fruits and vegetables. At the same time, each region traditionally had some narrow specialization (fruits for wine, cotton or flax for textile production). Today, high technological segment stimulating a process of creation a new forms of business that is assist to process of local diversification on human activity. This trend has a great role for creation a new regional business and specializations in context of minimize a risk of climate change. Modernization of agriculture has led more and more specialization for a number of key reasons. In general, new management techniques, harvesting technologies and flexible local economy policy can help to balance the local strategy on a way to model of Sustainable Development. Sustainable Development is a process, a way of solving problems peacefully and globally, using our science and technology, our know-how, and our shared global ethics to address our deep common needs (Sachs, 2015). The processes of adaptation to climate variability represent farmers efforts to solve problems in Human- Nature- Society system in the context of Sustainability.

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