From «Black sky mode» to ecologizing thought

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Abstract. The article introduces the environmental situation in Krasnoyarsky krai, it discovers the problem of “black sky mode”, and indicates how to solve the problem adequately using additional landscaping and ecologizing people’s thought. The research demonstrates the methodologies to form environmental thought and behavior. The article represents the social practices developed by Reshetnev Siberian State University of Science and Technology to reduce the air pollution.

1. Introduction

Krasnoyarsk krai is the second among the Russian Federation entities due to the area where the large amount of mineral resources are extracted, such as coal, nickel, platinum-group metals, siliceous sand, ores, and metancharcite. 70 % of the krai territory are timber resources concentrating in the area. The industrial wastes pollute the rivers and lakes, soil and air, the resources are extracted extensively; that results in environmental disasters and catastrophes. Therefore, Krasnoyarsk krai is among the three most polluted territories in Russia.

Industrial metallurgical and power plants’ toxic emissions contribute to bad air pollution in the krai, though not only big enterprises but small businesses dramatically damage the environment. Experts characterize the air pollution as intensive, and it often happens that it is extremely high with maximum air concentration of such dangerous substances as phenol, benzapyrene, formaldehyde, ammonia, oxide and sulfur oxide [1].

There were 22.4 thousand stationary polluting substance generators in 2016 according to the data of the Federal Service Agency of State Statistics (Krasnoyrsksstat). The polluting substance amount produced by the stationary generators was 8653.2 thousand tons in 2016. The air was contaminated with 2363.3 thousand tons of polluting substances, 95,1% consisted of gaseous and liquid substances (2247.9 thousand tons) [2].

Both the industries and the yearly increasing transport contribute to the air pollution: the car drivers number is increasing annually; the city population is on the 12-th place in Russia, the krai occupies the third place in the country due to the number of cars, 2 cars per family and the transportation level is usual for the industrial krai [3]. The situation is becoming worse, as Krasnoyarsk is located between two hills, and polluted air is stagnated.

As a result, lately, the krai and city population have got accustomed to the so called “black sky mode”. The mode is announced if there are industrial pollutants in the air; dangerous substances such as toxic fumes, (chemical substances), the fire smoke and wood fire smoke. There is heavy smog above the city districts and the krai for a long period in windless weather or higher humidity weather after the heavy and long rains, the air turns to smoke, people cannot breath easily.
2. Results and Discussion

As harmful contaminants head in the air, the krai authorities inform the citizens about the black sky mode or unfavorable weather conditions in politically correct language. Though the krai mass media has been far from being politically correct lately; as they suppose: the more information about the dramatic environmental conditions is in air, the greater the probability for the federal authorities to be aware of them.

Elena Penzina, Member of Legislative Assembly of Krasnoyarsk krai, speculating about ‘the black sky mode’, notices the main problem exists due to the lack of the complex solutions concerning 24 hour work of inspection agencies; she suggests, illegally functioning enterprises should be banned; public transportation should be transferred to EURO-4, big transport enterprises should follow environmental protection control rules [4].

Since organizing the environmental protection control is really difficult because of the political aspects in the governance; and the Krai industrial enterprises cannot be closed down, as it results in sufficient economic losses, the only possible solution can be additional territory gardening. Annually there should be more than 150 thousand new plants in the krai and ecologizing citizens’ thought.

We need to underline the long period of research of environmental problems in their global aspect and ecologizing thought, consciousness and science in general, G. Reale and D. Antiseri mention ecologising science to be an absolutely different approach to science, within its framework the issues of developing industrial civilisation turns to the issues of environmental protection and forecasting environmental consequences. Due to the approach, the main aspect becomes a certain social engaging and training new scientists to meet the criteria of responsibility for the biosphere state and the future of human beings. The environmental protection problems are certain to solve efficiently; the current technical development, technical tools to monitor the environment, and sufficient number of engineers-ecologists greatly contribute to the solution; it is necessary to set up the system environmental thought and a new ranking of social values [5].

It is apparent that we cannot solve the environmental protection problems without educating environmental thought and environmental culture; as a result, the up-to-date environmental recommendations are turning to the requirements to human beings, they need to minimize negative impact of the technology to nature, to redirect technological development to resource-conscious production technologies friendly to nature [6]. The fact is highlighted by many specialists; for example N.G. Mal’kevich writes a human being should live following the environmental norms preserving the nature, taking into account the rules preserving air and water purity, natural landscape, flora and fauna protection, decreasing personal energy and resource consumption [7].

Speculating the environmental protection challenges at the global level, V.N. Vasil’eva confirms that the future development of a society will mainly depend on the level of environmental culture and cautiousness of human beings. Forming the culture is closely connected with environmental thought and consciousness of citizens and their certain environmental focuses generating a basement of environmental behavior. The need in ecologizing thought is caused by the environmental challenges, tangible environmental crisis, the current state of environment; it reflects the sufficient demands of a society [8].

The system advocacy of environmental knowledge is one of the ways to ecology thinking in the society; it needs to provide scientifically excluding emotional and any personal prejudice. Mass media is the most powerful tool of advocacy; it can be used to inform the public about the levels of global and local environmental problems, as well as to promote environmental protection recommendations, norms and requirements systematically.

The important role in developing environmental thinking can belong to unofficial environmental institutions, for example, non-governmental ‘Greenpeace’ organizations, science technological and science education environmental protection centres, summer environmental protection camps for teenagers, environment-oriented exhibitions, excursions to national parks.

Currently, many cultural subjects (libraries, museums, community centres, youth centres) hold different discussions, disputes, conferences, lectures to promote environmental problem awareness, organize environmental exhibitions, contributing to development of ecologizing thinking of the population. Rather significant are other non-governmental institutions and establishments. One of the
outstanding examples is the activity of ‘The Consolidated National Front’ (CNF). CNF has joined the movement ‘LESEGAIS Volunteers’ in Krasnoyarsk krai. Using the National Information System for Recording Wood Resource and Wood Business, the CNF enthusiasts will fight against illegal logging; continue involving citizens to landscaping, setting up parks. At present the enthusiasts are busy with forming ‘the green shield’ of the town including not only woods, but also recreational areas, rivers, and lakes, vegetation plantations inside the municipal area [9].

Providing ecological education as continuous movement to realize the environmental knowledge is a guarantee of successful formation and development of environmental thinking and behavior of citizens.

However, comprehensive efficient forming environmental thinking and behavior needs to involve the education system into the process; the education system is responsible for forming personality, their knowledge, skills, and behavior at different levels (at preschool, school, college, and university). The system of education should form a citizen able to greatly contribute to life of a society including its ecologizing; the system should train professional staff and professional managers for all spheres, who are environmentally responsible. In this regard, the system of education focuses on the following assignments: 1) environmental education; 2) activity approaches in connection with the natural environment; 3) transformation of environmental values, norms, and recommendations to concise, rationally determined performance; 4) development of responsibilities for environmental protection results of their performance.

The stated tasks are certain to simultaneously perform social missions of any institute. Primarily and mainly, it relates to the sphere of higher education, namely, realizing the social functions by the universities in the society. In this context, the university social responsibility does not mean the common thought reproduction, culture development, and behavior norms, but environmental education. The last is accomplished in different forms: implementing significant environmental disciplines into the curricular; integrating humanitarian, environmental, and special disciplines due to their contents integration; including students’ community to the environmental projects, directed to solve local problems of the town and the region, expanding the range of volunteer movement, organizing and holding discussion platforms to the environmental protection problems. When the university participates in all events of the kind, it poses its social mission, on the one hand; on the other hand, the university forms the environmental thinking of education process participants.

We could demonstrate the social practices of Reshtnev Siberian State University of Science and technologies (SibSU). The Programme of Flagship University Development determines SibSU social mission in chapter ‘Development of the local communities of the town and the regional environment’ [10]; according to the document, the university needs to create and develop the Centre of Siberian gardening on the basis of Botanic garden named after V.M. Krutovsky. The Centre tasks are urban improvement and landscape gardening of the town territories, expert-advisory performance within the examining landscape projects, industrial technologies while implementing projects of landscape architecture, and designing the urban environment, gardening, and ornamental fruit-farming.

The Centre has been working for two years; it has proved its efficiency to form environmental culture, environmental thinking of the krai and town population. Moreover, there is cultural-educational centre on the territory of Botanic garden named after V.M. Krutovsky, working permanently; it is opened for all citizens and the tourists. The authority plans to develop an education demonstration zone of physic garden, where the herbs and medicinal herbs, garden crop will grow, cultivated as compositions.

The Centre of Siberian gardening advocates environmental protection by promoting environmental tourism, holding master-classes to fruit-trees and trees grafting, excursions to the sites designed by the Centre students’ projects; the Centre proposes the landscape projects to design parks, beach promenades, Surikov historic house museum, it organizes events to improve the urban territories. The Centre volunteers actively beautify the town districts by planting apple trees, designing ornamental flower beds, planting broad-leaved trees due to the gardening project for ‘Dendrosad’ park.

In general, the Centre employees and volunteer have improved approximately ten hectare territory for two years, developed two new tourist environmental routes.
Developing a volunteer movement, managing the young people environmental initiative consistently, organizing exhibitions, discussion platforms are an efficient university social practice; developing environmental tourist routes for the citizens greatly contributes to forming environmental thinking and behavior, and environmental culture of the population in general. 

The described practices cannot solve all environmental protection problems in the town and krai completely; neither do they reduce the pollution of metallurgical enterprises and power plants, nor liquidate deforestation, water body pollution, soil pollution, they are not able to eliminate the black sky mode. 

However, the environmental situation in the town can improve due to regular environmental education, consistent work of non-governmental organizations and institutions, educational and cultural institutions, involving variously-aged citizens into realizing environmental protection issues, mutual search for their solutions and the found solutions (cleaning up the Yenissei banks, urban territories, gardening).

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