
The green space as a key factor of ecological situation improvement in Almaty city (Kazakhstan)

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Abstract

Green spaces play a crucial role in improving the state of environment and the standard of living in cities. The role of green spaces as a key element of ecological framework we analyzed on example of Almaty city – former capital of Kazakhstan.

Almaty city is located in the South-Eastern part of the Republic of Kazakhstan in the foothills of the Northern spur of the Tien Shan - Zailiysky Alatau, at an altitude of 600-1650 meters above the sea level. The city is located in a depression, where calm weather, fogs and surface inversions, which make dispersion of pollutions difficult, are often observed. This feature leads to an accumulation in the surface layer the air pollution's products by exhaust gases of vehicles, emissions from power plants, industrial facilities. The phenomenon of smog has become habitual for the city of Almaty regardless of the time of year.

Today Almaty is the largest socio-economic, cultural and political center of Kazakhstan. The number of population constantly growing on 30-60 thousand per year during the last 15 years. Population growth is accompanied by growth of human pressure on city environment. The main contribution to the pollution of air, soil and surface waters make emissions which contain carbon and nitrogen oxides, hydrocarbons, particulates and heavy metals compounds.

The ecological framework of the city consists of different categories of land. Protected area (the Ile-Alatau National Park) and protective mountain forests are the core areas of the ecological framework. A large part of the green space of the city (both artificial and natural) is formed by the city's parks, gardens, green courtyard space, etc.

The project was aimed to analyze the differentiation of green spaces on the city's territory for the purpose of ecological functions assessment. The methodology based on evaluation of the framework's absorption capacity of different pollutions (dust, oxides of nitrogen and carbon, Sulphur dioxide).

The calculation of the green areas was carried out by using the program ArcGIS and satellite images on the study area with using the program SAS PLANET. The ranking of the city's districts according to the green spaces per capita was undertaken and the green spaces in Almaty were divided into 4 large groups, each of which is characterized by varying degrees of ecological functions: trees of natural and artificial origin, lawns and shrubs. The total value of ecological potential for each administrative district, based on the ecological potential of plants, was calculated. In addition, the human pressure on the territory of the city was evaluated. The recommendations for improvement of the environment through the regulation of the city's ecological framework suggested.

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Keywords: green space, urban ecological framework, Almaty city