

ENVIRONMENT PROTECTION

UDC 504.06(477.25)(045)

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Abstract. *Nowadays the investigation of ecological state of suburban areas in Ukraine is one of the leading problems. The suburban areas of Kyiv, environmental problems and their causes are described. Some ways and measures for improvement of environmental situation in the suburbs of Kyiv were revealed. The conclusion of the importance of suburban areas for city life activity was made and the urgent necessity for further all-round investigation of ecological issues of suburban area was shown.*

Keywords: ecological indicators; ecological problems; suburban area.

1. Introduction

Suburban area of large industrial city is a place of various environmental problems occurrence.

Suburban areas are multipurpose areas. They must ensure an environmental safety of urban population, largely solve recreation problems of townspeople, supply the population with everyday consumption products, and perform industrial, scientific, transport, cultural and welfare and other important functions, in terms of the viability of the city.

Today, an increasing part of industry, transport, trade and habitation of Kyiv is moving into suburban areas, which in turn are converted into new capital districts. Earlier, administrative integration processes always followed the classical dimensional growth of cities, sometimes even followed by it, but now we can about some institutional weakness of largest cities [Gaevskii, Rebkalo 1998].

Building and development of new non-urban areas should be organically combined with preservation of ecological situation of Kyiv's green zone and forest-park zone of the city, including conservation measures and subsequent formation of open spaces and landscaping systems, as elements of national ecological network on nationwide, regional and local levels, the introduction of Nation Reserve mode for elements of the national ecological network, such as Holiivsky forest, Dnipro islands, Dnipro-Desna interfluvium.

Suburban area (especially for large cities), is a real provider of fresh air, a place of recreation, it creates appropriate sanitary conditions for the city, supplies city with needed material goods.

According to Sh.I. Ibatullin [2007], the borders of suburban area are based on the comprehensive survey of the city and the study of its natural environment, the identification of economic, cultural, social relations, the analysis of historical factors of the city, etc.

At the moment the question of ecological status of suburban areas is becoming more and more actual.

2. Analysis of studies and publications

According to linguists, the word suburb (with Eng. – “Suburbs”) initially had dismissive, negative connotation. Suburbs of large cities were mainly the workers' settlements, inhabited by representatives of the poorest. Already in the XIX century, due to the development of transportation and utility infrastructure in Europe and America, the prestigious suburbs of large cities were founded, where very rich families settled. Gradually, the word “suburb” lost its negative connotation. But there were still small islands of prestigious suburban construction. The real extent of these processes met significantly later. Massive suburbanization began in the United States after World War II [Pchelintsev 2004].

Since the 90s of the twentieth century in Podillia the trend of suburbanization has been observed, especially in urban areas [Denysyk, Babchinska 2005].

Population and employment grew in suburban areas (before the crisis of social and economic development, where the recession was caused by the state of economic conditions on European and world markets), the rate of their development and significant recreational activity increased.

This has led to the increase of the intensity of nature using in urban areas and, accordingly, worsening of environmental processes.

Suburban territories of Kyiv are quite saturated with industrial and other objects that have a significant impact on its ecology.

Negative impact of urban agglomerations on the environment is evident. Industrial plants, rail and road transport pollute soil, surface and ground water, air, plants by highly toxic compounds. And the rate of suburban areas pollution by road transport is being constantly increased as increasing of its quantity. Changing of chemical composition and microflora of soil is also observed. Soils, adjacent to the city areas, are polluted in different extent by heavy metals and their compounds (Pb, Zn, Cu, Ni, Mn) [Molchak et al. 2008].

Most of scientific studies are focused on investigation of ecological situation in big cities, but there is only small number of studies, dedicated to ecological situation of suburban areas. Sh.I. Ibatullin [2007], O.I. Cherechon [1997], D.J. Schemo [1994] worked on the problems of suburban areas.

Steady urban development largely depends on the ecological condition of the surrounding area. And unfortunately, at present the risk of environmental degradation of the area is increasing.

Thus, the ecological conditions of Kyiv suburban areas can be important scientific and practical problem for today.

3. Statement of the problem

To investigate the state of the development of issues related to ecology of suburban areas. To show the complex of reasons, that leads to deterioration of the environment of such areas on the example of suburban territory of Kyiv.

4. The ecological problems

Kyiv City and its suburban area form a single economic and social complex – Kyiv agglomeration.

To explore the ecological assessment of suburban areas it is necessary to analyze the indicators of air, ecological conditions of water basin, soil and so on.

The composition of suburb area is defined by the areas of borders, where the impact of Kyiv is active, as on production processes, as on exploitation of land, labor, recreation, water resources, as on natural environment.

For separation of suburban areas in Kyiv we use the method of determining the impact zones of cities, based on the use of settlement field potential [Topchiiev 2001].

Due to this method, suburban area is limited by distance of 60–80 km from the city, namely in the zone of hour transport accessibility to the capital.

This area consists of 10 districts and 6 cities of regional significance, and the zone area is approximately 1,175.74 hectares – almost half of the territory of Kyiv region.

Territorial development of suburban areas is specified by necessity of rational land use. Therefore, in the suburb zone, close to Kyiv, placement of residential, municipal and recreational construction objects is primarily provided – as a result of complex of communication, economic, geographic and demographic factors.

On the base of analysis of industrial zones placement in the suburban areas of Kyiv it was found, that some areas of Kyiv region are developing as industrial and have a tendency to further development.

This areas include Brovary and some village councils of Brovary area (Velykodymerska, Kalynivska), Vyshneve and neighboring village councils (Petrivska, Tarasivska) of Kyiv-Sviatoshynsky area, new industrial-warehouse complex is constructed in the area between Petrivske, Bilohorodka and Tarasivka (promuzel “Zhuliani-3, Zhuliani-4”), Industrial Zone of Obukhiv and Ukrainka, Industrial Zone to the west of Vyshhorod, in Makarov area – along the highway Kyiv-Chop.

Along the major highways within 30–50 km from the border of Kyiv so-called logistic centers are formed, where industry is combined with storage and packing and maneuvering of large trucks [National...2010].

In the suburbs of Kyiv there are 335 large and medium industrial objects, some of which are environmentally hazardous.

The emissions of pollutants in 2011 were 269.0 thousand tons, 39% of which are emissions of industrial enterprises, 61% – are emissions from motor vehicles.

The largest amount of emissions from stationary sources is made by Tripilska TPP (Obukhiv area), solid waste landfill №5 (v. Podhirtcs, Obukhiv area), CJSC “Rosava” (Bila Tserkva), “Brovary Plastics Plant” (Brovary), CE “Vasylkiv leather factory” (Vasylkiv).

Kyiv Region is one of the energy-rich regions. On its territory, except Tripoli TPP, other power generating companies are placed: Kyiv HPP cascade

and PSP, TPP of Bila Tserkva, small hydroelectric power station on the river Ros (v. Dybentsi and Bohuslav) and distributing company JSC “Kyivoblenergo”.

These companies have significant impact on the ecological situation of not only adjacent areas, but also the country as a whole.

Power generating companies have negative impact on air (combustion of various kinds of fuel), cluttering of large areas of slag waste, pollution of river water, as well as a number of issues that have an impact on the environmental dimension of development (high ash content of coal, high energy intensity of power generation, significant environmental payments, etc.).

Regarding ecological status of the water basin, the main rivers of suburban areas of Kyiv are tributaries of Dnipro: Desna, Irpin Grouse, Stugna, Trubizh, Ros and small rivers that have mainly satisfactory state as in hydrobiological, as in hydrochemical indicators, in middle and lower reaches of these rivers processes of eutrophication are observed. But often, the excess of normative values in terms of BOD (biological oxygen demand), ammonia content, sulfates, chlorides, suspended solids is diagnosed.

One of the most contaminated are: Stugna, which is polluted by CE “Vasylkiv leather factory” (Vasylkiv), Kizka, which is polluted by CJSC “Complex Agromars” (Vyshhorod), where the reconstruction and building of water treatment facilities is still continuing. Sewage treatment facilities of Ivankiv hasn’t worked for years. Waste water without any cleaning was discharged to river Bolotna for a long time, but now to Teteriv River.

Another cause of deterioration of the water basin is aggradation of Dnipro banks.

In the structure of suburban lands agricultural lands are dominative – 58.38%.

Allocation of garbage dumps, cattle cemeteries, most of which do not meet sanitary requirements and often are unauthorized, the existence of 88 warehouses storing unusable pesticides – all this factors significantly affect the sanitary condition of soils.

Most part of pesticides is accumulated in:

- Zhurivsky (18% of total accumulation of pesticides in the region);
- Kaharlytsky (16% of total accumulation of pesticides in the region);
- Tarashchansky areas (11% of total accumulation of pesticides in the region).

The third part of unusable pesticides is downloaded and stored in special, adapted for long-term storage, concrete containers. Another, much larger part is stored in temporary containers; most of them are ordinary iron barrels and bags that are exposed to corrosion.

In most villages and settlements the system of regular sanitation cleaning of subordinated territories is not organized. The problems of collection and removal of garbage from the private sector and horticultural societies are still actual.

The settlements, which initially were built as a sanatorium and resort areas can be considered as relatively clean: Irpin, Vorzel, Lisova Bucha, Pushcha-Vodytsya, Boyarka in Kyiv-Svyatoshinsky area. In Obukhiv area such settlements are referred: Kozyn, Konche-Zaspa, in Boryspil area – Gora and Vyshenky, Kruglyk, in Vyshhorod area – Lyutezh and Hotyanivka [Savitska 2003].

Suburban area of Kyiv has 75 objects of natural reserve fund (NRF). Their total area is 1723.89 hectares (1.5% of the territory) and it is an important part of nature protection and formation of future regional ecological network [National...2010]. Most part is reserves (44 objects) and natural monuments (25 objects), 12 of which have national importance.

Next activities of NRF development are predicted:

- preservation of existing objects of NRF and ensuring of nature protection regime within their borders according to existing laws;
- creation of new NRF objects in reserved areas, including landscape and forest reserves, natural monuments and others to increase the protected area up to 3–5%;
- establishing the limits of all objects of natural reserve fund and imposition them in situ;
- development of projects of buffer zones of objects of natural reserve fund to reduce the impact of economic activities on NRF areas;
- conducting of scientific research to identify objects and areas that have significant nature protection value for further reservation, creation of such objects cadastre;
- maintaining of proper ecological conditions of recreational areas and agricultural lands, as well as various types of protective forest plantations, which should be included into the econetwork;
- completion of econetwork forming of suburban area of Kyiv as the part of regional econetwork of Kyiv region.

Today it is proposed to make 12 recreation zones on the territory of suburban area around Kyiv. These are such zones as Boyarska, Obukhivska, Rzhyschivska, Dniprovska, Plesetska, Klavdievo-Tarasivska, Borodyanska, Lyutyzhska, Katyuzhanska, Zalisska, Dubechanska and historical and cultural tourist complex "Park Kievskia Rus" in the area of Kopachivska Village.

These areas are characterized by availability of forest and water resources, in the vast majority, which contribute to the creation of recreational areas. These areas are intended for recreation of residents of the capital and suburbs.

It is necessary to reconstruct treatment facilities of Bortnychi aeration station, treatment facilities of Vasylykiv, Kaharlyk, Fastiv, Borodyanka, Dmytrivka, Gorenichi and Yurevka villages (Kyiv-Svyatoshynsky area).

In the localities of Vyshhorod, Brovary, Fastiv, Vasylykiv areas (total length 51 km) coastal protection measures are needed.

At the moment, it is necessary to build bypass roads around settlements, which would in turn reduce traffic of transit transport in Kyiv and big cities of Kyiv region (Boryspil, Boyarka, Fastiv, Kaharlyk) and decreased the mobile emissions.

Thus, the ecological problems of Kyiv region, as well as all regions of Ukraine, belong to the most urgent and require immediate solution.

5. Conclusions

The ecological safety of suburban areas of Kyiv requires creation there the most favorable conditions for life and health, work and recreation, because the environment of the city – is very complicated industrial, natural and social complex.

Every year the intensity of land degradation in Kyiv region increases, the state of which influences not only the efficiency of agriculture and environmental safety in general, but also on the level of economic independence.

And most importantly, the statements about the ecological well-being of Kiev region are not always true. Their appearance can be easily explained: the developers of cottage settlements endeavor to increase the value of their objects. For example, the "elite" today Obukhiv area is quite dirty due to the close proximity of the Landfill number 5, Tripilska TEP and landfill of construction waste number 1.

Not in the best way the Obukhiv Roads (Old and New) affect on the purity of air.

In the plans of Kyiv city administration we can see the construction of the incineration plant on the right bank of Dnipro, which, as experts believe, will significantly worsen the environment of this suburb.

In the article the causes of deterioration of suburban areas of Kyiv were specified and the analysis of ecological status of these territories was done. The measures to improve the suburban areas around Kyiv were proposed.

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Досліджено екологічний стан приміських територій України. Розглянуто приміську територію Києва. Показано екологічні проблеми та причини їх виникнення. Описано заходи поліпшення екологічної ситуації в приміській зоні Києва. Зроблено висновок щодо важливості приміської території для життєдіяльності міста та необхідності комплексних досліджень екології приміської території.

Ключові слова: екологічні показники; екологічні проблеми; приміська територія.

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Исследовано экологическое состояние пригородных территорий Украины. Рассмотрена пригородная территория Киева. Показаны экологические проблемы и причины их возникновения. Описаны пути улучшения экологической ситуации в пригородной зоне Киева. Сделан вывод о важности пригородной территории для жизнедеятельности города и необходимости комплексных исследований экологии пригородной территории.

Ключевые слова: пригородная территория; экологические показатели; экологические проблемы.

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