

## CONCEPTS OF RATIONAL LAND USE

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**Objective.** The concept of sustainable land use in the context of sustainable development of land development plays a very important role in modern models of land management. Conditioned by the agrarian orientation of our country, many publications are aimed at solving problems of rational use of agricultural lands, while other categories of land are given less attention. Taking into account the available features for other categories of land, the purpose of this publication is to summarize and to provide conceptual approaches to sustainable land use of industrial areas. **Methodology.** The results were obtained by analyzing the State legal acts of Ukraine, and from publications of domestic and foreign authors on issues of sustainable development of land and development of eco-cities in Ukraine and abroad. The study is based on official statistics and reports of The State Service of Ukraine for Geodesy, Cartography and Cadastre and State Statistics Service of Ukraine. **Results.** Based on current research on industrial land use, priority directions of their possible sustainability use were given, and the corresponding specificity was suggested. The concepts of “sustainable development”, “eco-city” and “eco-development” were defined and the results of foreign research on these issues were presented. It was established that in Western Europe, all land management is based on the principles of sustainable development with a significant influence of an environmental component, which is a burning issue in Ukraine as well. **Scientific novelty.** Scientific novelty is based on the suggestions for a possible adaptation of the environmental component of sustainable use of industrial land to form industrial park land parcels. **Practical value.** The development of the concept of sustainable territorial development and its adaptation in Ukraine for all categories of land is to become a priority in the near future. In this matter, the most important is the ability to combine the best practices of developed countries, while taking local conditions into account.

*Key words:* sustainable land use, sustainable development, eco-city, eco-development of industrial parks

### Introduction

Rational use of land resources has always been the foundation of the welfare of society. In the Ukrainian realities, given the priority of the state – agrarian land management – is the foundation of economic growth. Today there are many legal Acts of Ukraine and publications that focus on rational use of land.

The topic was a part of research by the following scientists: G. Aksenenok, D. Dobriak, V. Muntian, L. Novakovskiy, L. Perovich, O. Petrakovska, R. Panas, T. Priadka, A. Tretiak. In the majority of cases, rational land use was studied in terms of use of agricultural land. However, there are many factors that hinder the appropriate process. The most important, as we believe, is a moratorium on sale of agricultural land. It should be also noted that rational use of land of other categories that also form a land fund of Ukraine is not sufficiently regulated. In most countries, the whole system of land use is built on the principles of sustainable development of land. Special attention is given to the sustainable development of populated areas (cities).

The aim of this publication is to prescribe the rational use of land in the industrial cities, based on

the concept of “sustainable development” and identify opportunities for their adaptation in Ukraine. To achieve this goal, the regulations on management of land resources of Ukraine will be analyzed; the features of the implementation and operation of sustainable development of land in the Ukrainian realities will be explored; and the possibility of eco-development and the creation of eco-cities in Ukraine will be analyzed.

### Methodology

The research is based on the methodology of comparative analysis using deductive and inductive methods. The inductive reasoning used to define the specific aspects of Land Law of Ukraine and to summarize the best international practice. The deductive method will be used to make suggestions on how to adopt the foreign experiences into Ukrainian legislation. To substantiate the current situation in land use, statistical methods were used. Current official statistics was summarized and presented as charts.

### Statement of basic material

According to the clauses 4, 5 of the Land Code of Ukraine [Zemel’nyj kodeks Ukrai’ny vid

25.10.2001 № 2768-III], land legislation is based on the principles of rational land use and protection.

The existing legal acts of Ukraine determined that all land management measures are based on the principles of rational land use and protection. According to the Article 2 of the Law of Ukraine “On Land Management” [Zakon Ukrainy “Pro zemleustrij” vid 23.05.2003 № 858-IV], Land Management provides forecasting, planning and organizing aspects of rational land use and protection at the national, regional, local and economic levels. The Article 20 [Zakon Ukrainy “Pro zemleustrij” vid 23.05.2003 № 858-IV] determined the need to develop land management documentation on organization of rational use and protection of land, and Article 35 [Zakon Ukrainy “Pro zemleustrij” vid 23.05.2003 № 858-IV] is provided to determine the inventory and account of land that is used inefficiently. Immediate study of rational use of land is based on soil, geobotanical, and other surveys, included in papers on land management.

At the national and regional levels, the rational use of land is made based on land management schemes and feasibility studies for land use and protection of administrative units. At the local level, the rational use and protection of land is

performed by land management projects that provide environmental and economic assessment of crop rotation and organization of land and land management projects to establish the residential areas.

There is a similar description in the Law of Ukraine “On Land Protection” [Zakon Ukrainy “Pro ohoronu zemel” vid 19.06.2003 № 962-IV] that does not contradict other state legal acts of Ukraine. It should be noted that the above formulation of rational use of land is often related to agricultural land, most of which falls under the moratorium for sale. According to statistics of the State Service of Ukraine for Surveying, Mapping and Cadastre, 96 % (41 million ha) of land is covered by the non land sale moratorium. Its distribution by designated purpose is shown in Fig. 1.

It should be noted that agricultural land covers more than 70 % of all land in Ukraine (Fig. 2). In our opinion, the moratorium on the sale of agricultural land adversely affects their sustainable use.

The state legal Acts of Ukraine do not resolve issues of rational use of land of other categories. Particular attention should be paid to the built-up areas where most of the buildings are concentrated, which, among other things, are city-forming industrial facilities, which form a large part of Ukraine’s GDP [Petrakovska and Tregub 2017, M. Tregub and Y. Tregub 2015].

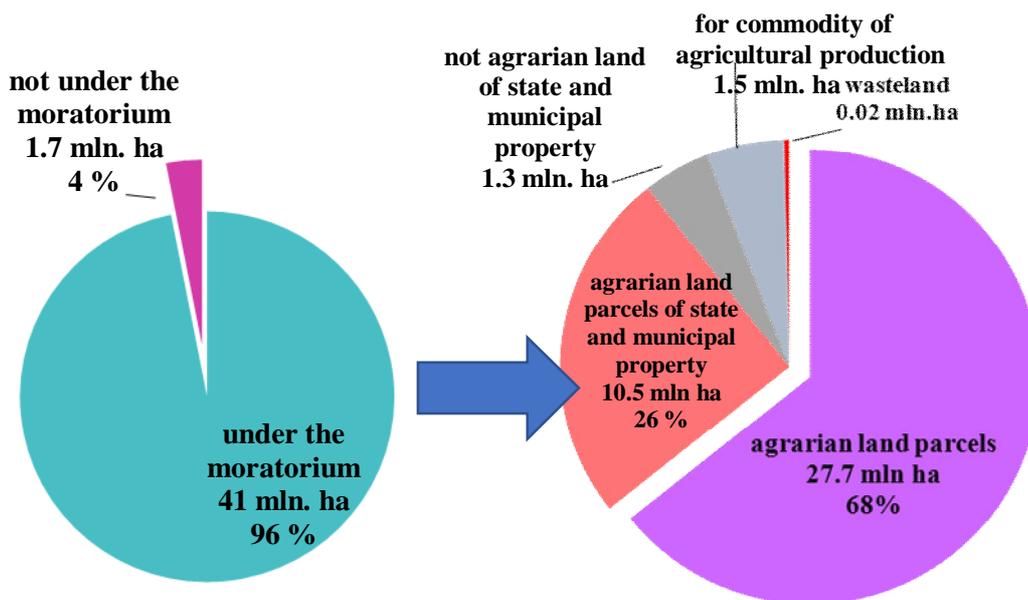


Fig. 1. Distribution of agrarian land parcels

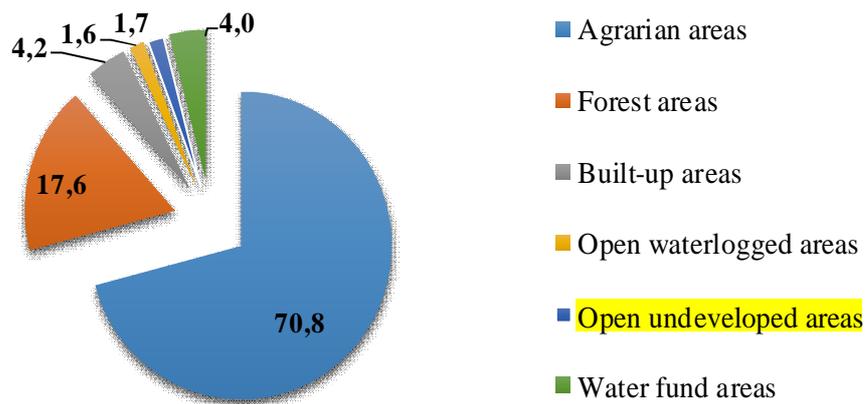


Fig. 2. Structure of land fund of Ukraine ( %)

Innovative strategies for the development of industrial areas in Ukraine was initiated in 2012 with the establishment of industrial parks. The experience of developed countries shows that Industrial parks reveal new possibilities for improving production, job creation, and maintaining a healthy competitive environment.

Up to 2017, in Ukraine 23 industrial parks have been established, 17 of which are registered in the Register of Industrial Parks of Ukraine (Fig. 3–4).

One of the main conditions for the formation of an industrial park is the belonging of land planned for this purpose to the land industry. Historically, in Ukraine the most developed industrial regions are in the East and South. But what do we see in Fig. 4? Almost none of the industrial parks were formed in the Eastern and Southern regions of Ukraine, although all the conditions for their development are more than favorable.

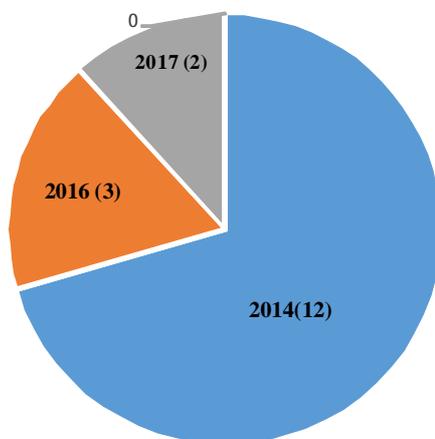


Fig. 3. Data of the State Register of industrial parks of Ukraine 2012–2017

The situation changed only slightly at February 14, 2017. The Register of Industrial Parks of Ukraine was supplemented by another facility, located in Pavlograd Dnipropetrovsk oblast. Earlier in the Register there were only the industrial parks Kryvbas and Kryvyi Rih in the Dnipropetrovsk oblast.

Industrial parks are very important for the economy of the state in improving its investment climate. So, an increase in their numbers, especially in the central and eastern areas will significantly improve the country's investment activities and conduct redistribution of industrial areas for their sustainable use.

In the developed world, the use of all resources, including land, is based on the concept of “sustainable development”.

Since the 1980s, humanity started to discuss the aspects of eco-development, development without destruction, and the need for sustainable development of ecosystems. Within a short period of time, the term has changed and transformed from a purely environmental to the general trend.

The term “sustainable development” at the Conference in Rio de Janeiro in 1992 under the adoption of the “Agenda for the 21st Century” was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [Programa dij “Porjadok dennej na XXI stolittja” 2000]. This definition is taken as the basis for the interpretation of sustainable development. Ever since that time, sustainable development is subsequently regarded as a set of economic, environmental and social factors that shape the use of high-quality environment.



Fig. 4. Network of industrial parks of Ukraine (2017)

In the middle of 1980s, the first scientific directions were developed on the formation of sustainable urban development (settlements) or eco-cities.

Energy-efficient construction and environmental reconstruction of the city developed in North America and Europe has been a desired objective for over twenty years. There were many successful examples that demonstrate the potential and prospect of this process. In Ukraine, urban development is practically not implemented, while many solutions are already grounded in present economic conditions. Other developed countries have moved from the development of industrial parks to greening land use.

The concept of eco-towns is a rationally organized habitat of people living in eco-buildings having a maximum use of renewable energy. Eco-city should focus on the pedestrian and not on transport within the concept of harmony between man and nature, thus minimizing the use of transport and its related infrastructure.

There are several general approaches to the development of eco-cities:

- planning of urban areas are based on the concept of eco-towns;
- development of energy and renewable energy sources;
- informing the world population about the importance of changes in the urban development sphere;

- increasing the planting and greening of territories, etc. [Hens 2010].

Eco-city has developed and will be the most profitable, when the following conditions are taken into account:

- public service and consumer behavior;
- environmental efficient industry;
- incentives for consumers;
- support for innovative research related to environmentally-oriented technologies [Siracusa et al. 2008].

The concept of eco-towns is actively developed in Sweden, Denmark, Germany, recently interest has increased in the US, Czech and Poland. The Swedish experience concerning land use is very valuable for all countries, and is the basis of multiple studies of the phenomenon.

All environmental issues are better accepted and supported at the state level than at the local level. This could be proven by the levels of information perception and action. It is believed that in smaller communities, and even more in each individual citizen, the understanding of the problems is significantly lower [Lindstrum and Küller 2008].

The main obstacle of sustainable development of cities is high first-time expenses [Owensby-Conte and others 2012]. While in some countries the problem is partially solved by relevant

specially developed standards that articulate the requirements for construction, that include certain tax benefits of which the developer is responsible for. In such circumstances, the results will appear later.

Now there are world-wide approved basic characteristics and approaches to sustainable development areas:

- smart economy;
- smart mobility;
- intelligent environment;
- smart people;
- prudent government;
- quality of life [Giffinger and oth. 2007].

Special attention should be paid to industrial land. With the start of the allocation of land for industrial parks as a new trend in Ukraine, it would be at the same time better to make decisions on greening of land.

All the above components together give the desired result, but in the case of neglecting even one of the characteristics, the result will be neutralized, which actually happens in Ukraine.

Interesting is the possibility of applying the Rotmans' theory and using S-curve of innovation tracing the path that Ukraine (or any other country) should take to implement in practice the concept of "passive house" (approaching all new buildings to energy neutrality) [Rybchyns'ka 2014]. So there is a possibility to determine which region is the most appropriate for relevant concepts and to identify factors affecting the territory.

In Ukraine, so far, cities have been excluded from the concept of eco-towns. Although some initiatives are provided by the Association of energy-efficient cities of Ukraine, which members are the generators of signing the Covenant of Mayors [Ugoda meriv 2007]. In terms of current local government reform, the transition to unification of communities, it would be expedient to choose a model of implementing one of the directions of sustainable development.

### **Conclusions and prospects for future research**

The legal Acts of Ukraine that form an idea of the rational use of land were analyzed. Based on the experience of Western Europe the necessity of transition from an industrial society to

Ecocodevelopment was substantiated. Specific concepts of "sustainable development", "eco-city" and "eco-development" were determined. Unfortunately, we can assume that approaches defined in this article are not presently implemented in Ukraine. It is proposed to introduce these relevant principles of land use in our country.

It is recommended to aim further research at systematizing the principles and factors of sustainable development for all categories of land.

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### КОНЦЕПЦІЯ РАЦІОНАЛЬНОГО ЗЕМЛЕКОРИСТУВАННЯ

**Мета.** Концепція раціонального використання земель у розрізі сталого розвитку територій посідає найважливіше місце в сучасній моделі управління земельними ресурсами. У зв’язку з аграрним спрямуванням нашої держави є велика кількість публікацій, спрямованих на вирішення проблем раціонального використання земель сільськогосподарського призначення, а на інші категорії земель звернуто менше уваги. З огляду на наявні особливості використання інших категорій земель, метою цієї публікації є формування концептуальних підходів до раціонального використання земель промисловості. **Методологія.** Результати дослідження були отримані на основі аналізу нормативно-правових актів України, наукових публікацій українських та закордонних авторів щодо проблематики сталого розвитку земель та еко-розвитку міст в Україні та світі. Дослідження ґрунтується на офіційній статистичній інформації Держгеокадастру України та звітах Державної служби статистики України. **Отримані результати.** На підставі дослідження наявного стану щодо використання земель промисловості, визначені пріоритетні напрями їх можливого раціонального використання, а також відповідна специфіка. Визначені поняття “сталий розвиток”, “екомісто” та “екорозвиток”, наведені результати досліджень закордонних науковців з цих питань. Встановлено, що у країнах Західної Європи усе землекористування ґрунтується на принципах сталого розвитку із значним впливом екологічної складової, що необхідно і Україні. **Наукова новизна.** Наукова новизна ґрунтується на пропозиціях щодо можливої адаптації екологічної складової раціонального використання земель промисловості для формування земельних ділянок індустріальних парків. **Практичне значення.** Розвиток концепції сталого розвитку територій та її адаптація в Україні для усіх категорій земель має бути пріоритетним завданням у найближчому майбутньому. У цьому питанні найважливішим є можливість поєднати найкращі традиції розвинених країн, з урахуванням місцевої специфіки.

*Ключові слова:* раціональне використання земель, сталий розвиток, еко-місто, еко-розвиток, індустріальний парк.

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