

## ON SIGNIFICANT PROJECTS OF UKRAINIAN GEOGRAPHERS IN THE EUROPEAN CONTEXT OF UKRAINE'S DEVELOPMENT

*Leoníd RUDENKO, Sergiy LISOVSKIY, Eugenia MARUNIAK, all Kiev [Kyiv]\**

*with 4 figures and 2 tables in the text*

### CONTENT

<i>Summary</i> .....	527
1 Introduction .....	528
2 National Atlas of Ukraine .....	529
3 Landscape planning in Ukraine .....	531
4 Atlas of Natural, Technological and Social Hazards and Emergency Risks in Ukraine .....	538
5 Conclusion .....	541
6 References .....	541

### *Summary*

*Nowadays information, knowledge and innovation are key factors of success in development at all levels, reflected in such concepts as 'knowledge economy', 'knowledge-based economy'. Countries lagging behind in the transition to a post-industrial society automatically fall into the category of outsiders of the global hierarchy whose territorial capital is used for the benefits of more successful competitors.*

*On their way to better horizons Ukraine and other countries face numerous challenges, including:*

- *Problems of integration into the global space (for society and science etc.);*
- *Obstacles to establishing strong links between Research & Development and their implementation in management and other fields, especially in nature protection;*

---

\* Leoníd RUDENKO, Prof., PhD., Sergiy LISOVSKIY, PhD., Eugenia MARUNIAK, PhD., all Institute of Geography, National Academy of Sciences of Ukraine, Volodymirska str., 44, UA-01030, Kyiv, Ukraine; email: geo-ins@kiev ldc.net, EMgeooffice@gmail.com

- *Conservation of their own research traditions, related to the country's social and natural features.*

*However, there are territorial assessments (mostly based on geographical methodology), that create an important basis for management and decision-making in the context of spatial development. Thus the contribution of geography is valuable, as will be demonstrated using case-study projects important for knowledge diffusion, governance and the implementation of sustainable development provisions in Ukraine and abroad.*

## **1 Introduction**

In Ukraine, geography is offered at 22 universities and in the Institute of Geography of the Ukrainian National Academy of Sciences. Thus, as in the European Union (EU) countries, many geographers combine teaching and research activities; however, the contribution of Academy's research remains essential.

There have been several significant state-level projects, implemented in recent years, including the National Atlas of Ukraine (paper and electronic versions), developed on the Institute of Geography's platform, with an additional book containing texts and legends of maps in English and Russian. The atlas presents unique information about the state's history, natural and economic resources, as well as population and living conditions.

In methodological terms, important results were obtained in the framework of the European innovation project on landscape planning (LP), which has had high practical value for the model Ukrainian region, Cherkasy Oblast. The project's key themes included conservation of the cultural landscape and sustainable development, biodiversity as well as climate change adaptation. The European methodology of LP was implemented in Ukraine for the first time and allowed for an inventory and evaluation of regional conditions to be carried out, as well as to identify nature-use conflicts and elaborate on the development objectives on three levels (region – landscape program, administrative district – landscape framework plan, local community – landscape plan). According to the project tasks, the concept of the Kaniv Biosphere Reserve was also developed.

Finally, by the end of 2014, the Atlas of Natural, Technological and Social Hazards and Emergency Risks in Ukraine will be completed. The Atlas has been created in an e-version and consists of five chapters: introduction, preconditions for potential emergency situations' appearance, factors of possible risks and hazards, emergency situations in Ukraine, a prevention of emergencies. Due to the Atlas's content its practical utilisation will contribute to disasters prevention. The Atlas also might be helpful for saving of the State Emergency Agency's human and financial recourses.

Other possible Atlas's functions such as management assistance, disasters recovery and informational provision should be mentioned.

All three of the above-mentioned projects also are particular interdisciplinary communication platforms that have united scientists, authorities' representatives, non-governmental organisations and are good examples of geography's pragmatic function rising the science's social status and public awareness.

## **2 National Atlas of Ukraine**

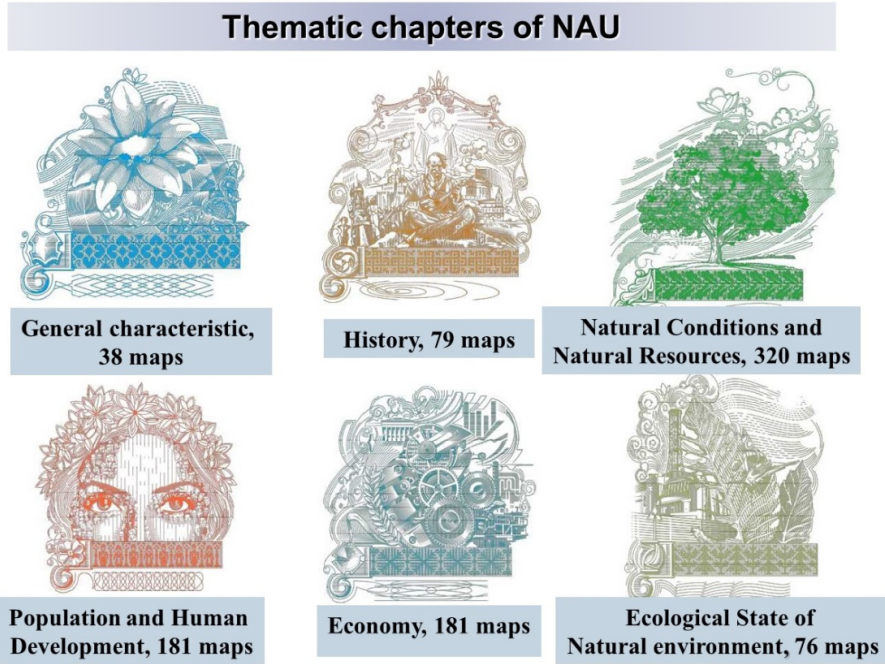
The National Atlas of Ukraine (NAU) was conceived and developed as the fundamental, comprehensive cartographical work to give a complete representation of the nature, population, economy and ecological state of the environment components, history and culture of our country (RUDENKO et al. 2007).

The concept of NAU, which reflects the experiences of creating national atlases, was built up at the Institute of Geography of the National Academy of Sciences of Ukraine. The NAU is produced as a fundamental cartographical product for multi-purpose use. It presents findings of the newest fundamental scientific research in many disciplines – geography, history, geology, geophysics, botanics, economics and other sciences – that have allowed for the creation of a uniform information base for various uses. An important principle of this Atlas is an integrated approach and an attempt for synthesis: historical background as well as maps illustrating development, changes, dynamics of the natural and social-economic phenomena and processes. Another aim is demonstrating data in a consistent cartographic form.

The NAU's concept realisation began after the issuing of the President of Ukraine's Decree "On the National Atlas of Ukraine" (No. 574/2001 from 01/08/2001) as a one-volume atlas. The basic map of Ukraine in the scale 1:2,500,000 is complemented by maps in the scales 1:4,000,000, 1:5,000,000, 1:8,000,000, 1:12,000,000. The Atlas is available both in paper (with an additional volume containing Russian and English texts and legends) and electronic form. The content is structured into six thematic chapters: general characteristics, history, geographical description and natural resources, population and human development, economy, and state of the environment (Fig. 1).

The maps in the chapter "General characteristics" are aimed at representing Ukraine as a part of the World and Europe. It presents the role and place of Ukraine in the natural landscape and its political, economic, social environment. The chapter includes 47 maps on 26 pages (5.42% of the whole Atlas) and has two sections: "Ukraine and the world", and "Ukraine". The "Ukraine" section is divided into three subsections: general characteristics of Ukraine, power and society, and natural and cultural heritage.

Figure 1: The National Atlas of Ukraine’s thematic chapters



The chapter called “History” includes four sections representing ancient history, early modern times, Ukraine in modern times, Ukraine in the late modern times. The chapter includes 74 maps placed on 30 pages (6.25% of the Atlas).

The “Natural environment and natural resources” chapter includes 13 sections, which look at geophysical fields, geological structure, mineral resources, hydrogeological conditions and resources, engineering-geological conditions, relief, climatic conditions and resources, surface water and water resources, soils and soil resources, the plant world and its resources, the animal world and its resources, landscapes and physiographic zoning, seas and their resources. The chapter includes 321 maps placed on 150 pages (31.25% of the Atlas).

The chapter of maps relating to “Population and human development” displays general principles and regional differences in population distribution, condition and tendencies of population properties and characteristics. The basic concept in population study is the concept of ‘vital activity’ (settlement, labour, reproduction, consumer and other functions) and to a certain extent the concept of ‘spirituality’ (national, linguistic, confessional and cultural identification). The chapter’s structure includes 17 sections, which address number, structure and distribution of population, migrations, national

composition of population and ethnic distribution, integral characteristic of human development, labour market, income and expenditures, sickness rate, health services, and the social sphere. The chapter includes 178 maps on 63 pages (13.12% of the Atlas).

The thematic chapter “Economy” presents information about the development of Ukraine’s productive forces, structure, specialisation and the territorial organisation of the economy, general tendencies of economic transformation and Ukraine’s place in world economy and information space. The chapter includes ten sections displaying general characteristics of the economy, including transformation processes in economy, finance and credit, industry, agriculture, water industry, forestry, hunting and fishing, construction and investments into fixed capital, transport, communication and information, and wholesale trade. The chapter spans 97 pages (20.21% of the whole volume of the Atlas).

The chapter on the “Ecological state of the natural environment” is dedicated to characteristics as well as the assessment of the consequences of society/nature interaction. The chapter is divided into six sections: atmosphere, hydrosphere, soils, flora and fauna, anthropogenic environmental impact and environmental monitoring. The chapter features 75 maps on 31 pages (6.45% of total volume of the Atlas).

The electronic version of the NAU is based on the following principles:

1. The general architecture is defined by the structure of the NAU dataware.
2. The concept of the NAU is realised using internet technology and in HTML.
3. Necessary functional capacities, primarily map operations, are realised on the base of product-oriented Activex components embedded in the HTML pages of the NAU.

The NAU as a complex information system has a number of functions. Extensive and representative information capacities of the Atlas allow its use in many spheres: in legislative and administrative activity on the national and regional levels, for solving different tasks of sustainable regional development (MINISTRY OF ECOLOGY AND NATURAL RESOURCES OF THE UKRAINE 2015). The Atlas, as a knowledge source, is used within the educational system, and in developing cooperation between regions of Ukraine and its neighbours.

### **3 Landscape planning in Ukraine**

Landscape planning (LP) is an important instrument in European spatial planning, which ensures the implementation of sustainable development principles into

appropriate policies (BUNDESAMT FÜR NATURSCHUTZ 2012). The importance of landscape policies for successful regional development was emphasised in the Guidelines for Sustainable Spatial Development of the European Continent, which is formulated as “the integration of the landscapes development issues into spatial planning and sectoral programs” (BUNDESKANZLERAMT ÖSTERREICH 2000), the “implementation of integrated policies aimed at simultaneous landscape protection, management and planning.” Within the European Landscape Convention, the term is defined as “long-term planning, aimed at landscapes enhancement, restoration and formation” (INSTITUTE OF GEOGRAPHY, RUSSIAN ACADEMY OF SCIENCES 2006).

In Ukraine, the concept of landscape planning is in its formation stage, however, its aim is not the birth of a fundamentally new type of development (RUDENKO et al. 2014). The desired result is achieved more quickly through improvement, optimisation and integration of the methodologies, which have been formed within such directions as landscape science, territorial planning, environmental management and sustainable development. In addition, while developing specific recommendations for a particular place and time interval, the pragmatic function of geography and its complexity, aimed at harmonising society-nature relationships, is significantly enhanced (RUDENKO & MARUNIAK 2012). The project “Landscape Planning in Ukraine” became the starting point for LP implementation both at the national and regional levels.

The range of landscape plans, data resolution, degree of results generalisation, and, accordingly, the specification of objectives and measures, which depend on the local government, have been considered according to a German approach (HAAREN 2004; HEILAND & MAY 2009; HEILAND 2010), which, in turn, meets the concept of national spatial planning. In Ukraine the planning levels are oblasts (regions), districts and territories of local government (village and town councils).

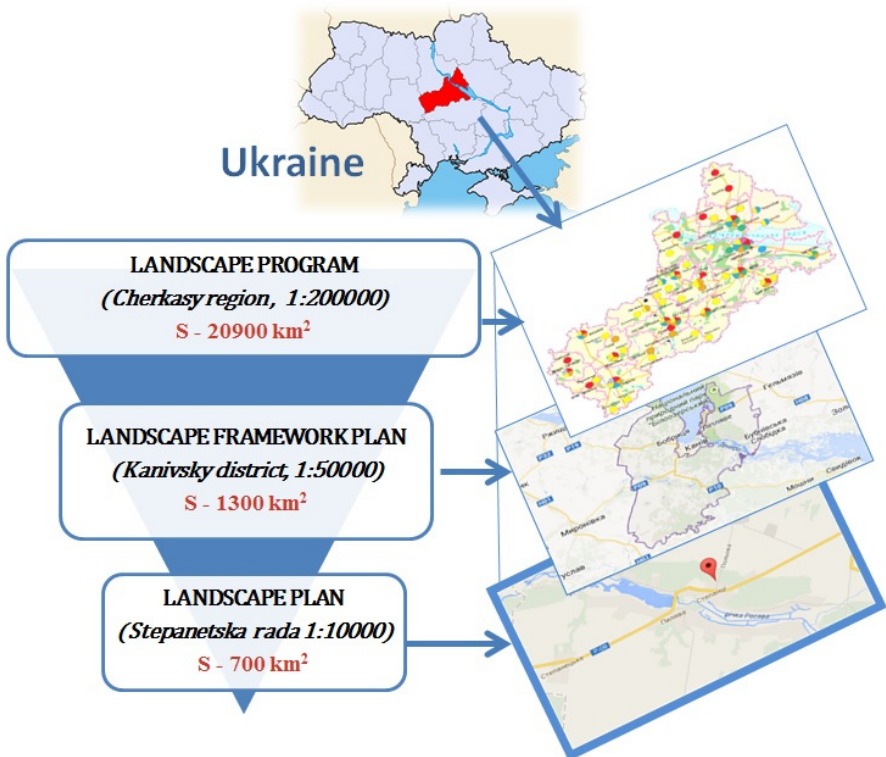
Thus, the following principles are at the heart of LP introduction in Ukraine:

- The integration of fundamental European methodologies with the methods and approaches of national schools;
- Original methodology with careful consideration of spatial specifics;
- The collection and interpretation of various data (limited by quality and access) considering the importance of expert opinion, balanced combination of mapping and textual parts of the developments;
- Orientation towards the interested governmental and public bodies with a corresponding agreement on achieving development objectives and overcoming identified conflicts;
- High practical significance of the results directed at solving specific problems caused by national legislation development;
- The key issues of methodological provision for landscape planning are: the aim of research in the planning; the sequence of landscape planning tasks; the development system and results of implementation into practical activities.

Landscape planning is carried out sequentially at several stages. Each stage is focused on specific tasks, whose solution relies on the use of appropriate methods. The integrity of all landscape-planning stages is provided through the use of geographic information systems as a tool for the creation of an output database, landscape analysis and assessment, interpretation and visualisation of the results. The main stages of landscape planning are:

1. Definition of the landscape-planning framework objectives
2. Inventory and data assessment
3. Identification and assessment of nature-management conflicts
4. Development of the environmental protection goals and measures concept
5. Adoption, implementation and monitoring

Figure 2: Levels of landscape planning in Ukraine (the Cherkasy Region)



The Cherkasy Region in Ukraine was selected as a model region for work on the LP. The following three levels of work have been performed within it: landscape

programme (region territory, 1:200,000), framework landscape plan (Kaniv District, 1:50,000), landscape plan (Stepanetska Village Council, 1:10,000). The area of the region is 20.9 thousand km<sup>2</sup> (3.46% of the country's territory), the population as of 2013 was 126,730. Like other Ukrainian territories, the region is experiencing the consequences of acute social and economic crisis and deterioration of state and quality of the environment.

The Cherkasy Region is an agro-industrial region, where natural ecosystems are still preserved, including forests, wetlands, steppe areas, which are not part of a nature reserve fund or which only have regional significance. There are areas classified as international facilities (Ramsar Convention) and old protected areas (Kaniv Nature Reserve). The area of the nature reserve fund has been legally expanded in recent years, a source of numerous conflicts within local communities and village councils. Significant, too, is the historical and cultural heritage represented by archaeology (including settlements relating to the Trypillia culture), architecture, historical monuments and sacred buildings.

At the same time there is a high degree of anthropogenic pressure (ploughing, emissions, waste), which should be reduced in order to protect ecosystem and population health and to provide for an effective economic development. The structure of agricultural land use is irrational, with the continuing rise of soil depletion in crop areas, multiple examples of unauthorised construction within river floodplains, and a high probability of new large industrial facilities construction.

There is also a chance of adverse environmental processes occurring such as water and wind erosion and flooding, and the consequences of climate change. The latter threat may seem abstract for such a homogeneous and stable climate as of Central Ukraine, but is absolutely real in its relation to the key features of the territory. The problems of water availability in certain areas, the intensification of droughts and tornados, degradation of wetlands, changes in species composition in the areas of the natural reserve fund, the emergence of alien flora species – this is only a very simplified list of potential consequences.

Based on this situation, the main reasons for the work on landscape planning and why this region was selected as a model are:

- The need to reduce anthropogenic pressure on the region (ploughing and inefficient land use, impact of industrial facilities);
- The preservation of natural ecosystems and development of a network of landscape- and biodiversity-protected areas (prerequisites defined by law);
- The preservation of historical and cultural heritage (primarily within the existing historical and cultural reserves);
- The effective use of recreational activities potential;
- Resolving a number of conflicts in land use;



- Upgrade of the region's territorial planning schemes.

An integral objective is to solve the problem of optimal balance between environmental and economic activity, raise efficiency of recreational potential use and comprehensive (sustainable) territory development.

LP in the region should focus on the specification of the environmental objectives and principles of the region's territorial development depending on the specific environmental conditions and prevailing economic and social features as well as on the development of proposals to seek balance of interests among various natural resource users. Therefore, the key themes are landscape and biodiversity conservation, development of cultural landscapes and sustainable development, climate change accounting and its consequences. In particular, amongst the main priorities within the Cherkasy Region Landscape Programme, the following were identified:

- Justification of proposals for preservation and use of the protected areas fund;
- Preservation of biodiversity;
- Preservation of historical and cultural heritage, including valuable cultural landscapes, as well as identification of landscapes according to the European Landscape Convention;
- Eco-friendly land use;
- Use of the recreational potential;
- Balance of interests between different land users;
- Harmonisation of environmental, economic and social interests (sustainable development);
- Prerequisites for the consideration of landscape-plan recommendations for different territorial and sectoral plans.

For the **Landscape Programme** (RUDENKO et al. 2013) as for each level of landscape planning data were collected on:

- Characteristics and structure of natural resources potential, land use structure, pollutant emissions, waste disposal, hazardous objects, etc.;
- Climatic conditions: solar radiation, circulation of the atmosphere, atmospheric pressure, wind direction, air and soil temperature, precipitation, atmospheric phenomena, the local climate (mesoclimate) and mesoclimatic zoning;
- Surface and ground waters: the reserves of underground and surface waters, depth of underground waters, relative levels of water-bearing horizons and their characteristics (distribution, power, chemical composition, etc.), quality of surface waters, water consumption;
- Distribution of flora and fauna species; main biotope types; concentration areas of rare plant and animal species listed as endangered;

- Soil: distribution of soils and soil components, physical-chemical properties of soil (grain size, cations-exchange capacity, humus content, pH, permeability), areas with the presence of unfavourable for business processes (salinisation, waterlogging, washed-away soil); radioactive contamination as a result of the Chernobyl accident;
- Landscapes – preserved in their natural state and modern ones; territorial localisation and characterisation of cultural and historical heritage.

The integrated concept of objectives based on the results of the Cherkasy Region assessment and analysis of existing and potential conflicts associated with nature management has become the main resulting document of the Landscape Program. Development of the sector objectives, which outline the main areas of sustainable resources use (surface and ground water, climate, air, soil, plants and animals, landscapes) preceded the map’s final creation. At the final stage of landscape planning, sector objectives are integrated into the resulting map “Integrated concept of objectives” (Fig. 3).

Figure 3: **Integrated concept of objectives (the case of the Cherkasy Region, Ukraine)**



Legend:

- 1 – Nature conservation. Ensuring and monitoring existing protected areas status;
- 2 – Spawning fish;
- 3 – Natural and cultural heritage protection;
- 4 – Sustainable agriculture;
- 5 – Sustainable land use with a focus on ecosystem services, which need protection;
- 6 – Sustainable land use with a focus on tourism and ecological networks;
- 7 – Areas of plants and animals rare species concentration, in future the core of the ecological network; particular mode of nature use and regulated tourism;
- 8 – Remediation of negative impacts on the landscape to improve ecosystems;
- 9 – Water erosion;
- 10 – Erosion of riverbanks;
- 11 – Wind erosion;
- 12 – The consequences of radioactive contamination of soils, highly sensitive to chemical pollution;
- 13 – Permanent flooding;
- 14 – Remediation of negative impacts on the landscape to improve living conditions.

Finally the Landscape Program is an up-to-date document, which contains information about the state of the environment, anthropogenic pressure, related present and potential conflicts as well as objectives and directions of spatial development at different levels (Table 1). This is the first such document developed within the framework of traditions and experience of European landscape planning. It consists of text (detail description) and maps (digital and paper). There are ten main maps (scale 1:200,000) and more than 40 maps in smaller scales, which contain inventory and assessment outputs for the region's territory. They are in line with the Cherkasy Oblast Territorial Plan and provide spatially proven recommendations as a complex basis for decision making and the region's development strategy.

Table 1: **Cherkasy Oblast: the landscape program's structure**

<i>Content</i>	<i>Annexes</i>
Introduction	Annex 1. Climate (set of maps)
1. Preconditions for landscape planning implementation in Ukraine	Annex 2. Groundwater sensitivity to chemical contamination
2. Cherkasy Oblast as a model region. State and features of its development	Annex 3. Types of soils
3. Inventory and assessment	Annex 4. Soils' importance for crops
3.1. Land use particularities and main problems	Annex 5. Species and biotopes sensitivity
3.2. Climate and air quality	Annex 6. Species and biotopes importance
3.3. Groundwater and surface waters	Annex 7. Modern landscapes
3.4. Soils	Annex 8. Landscapes attractiveness for tourism and recreation
3.5. Flora and fauna, biotopes	Annex 9. Conflicts
3.6. Landscapes and recreation	Annex 10. Concept of objectives
4. Nature-use conflicts	
5. Concept of objectives	
5.1. About the Concept	
5.2. Branch targets	
5.3. Concept of objectives: conclusions for spatial development	
6. Partnership with authorities and NGO's	
Afterword	
Terms and concepts	
List of annexes (maps 1:200,000)	

The basic scale of the **Kaniv Region Landscape Framework Development Plan** is 1:50,000. The data inventory has been carried out based on indicators similar to the Landscape Program; they are summarised and organised in a geographic information system (GIS). Given the framework landscape planning aims, the landscape assessment aims at obtaining the basis for developing recommendations for landscape and biodiversity conservation as well as reforming associated with the network of environmental fund facilities; development of recreational activities; improvement of the farmland structure to prevent destructive processes. As a result of landscape planning in order to support sustainable development of the Kaniv District, it was recommended that a biosphere reserve be created (47% of the territory) at the territory of the Kaniv Natural Reserve (GOLUBTSOV & CHORNYI 2014). There were developed over 30 maps, with nine maps presented as annexes: “Modern land use”, “Soil types”, “Soil fertility. Soil sensitivity to water and wind erosion”, “Species and biotopes”, “Landscapes. Potential for tourism”, “Conflicts and hazards”, “The concept of objectives and measures for the Kaniv Biosphere Reserve within the Kaniv District”, and “Kaniv Biosphere Reserve”.

The **Stepanetska Community Landscape Plan** as well as documents for other levels includes text and several maps, partly represented in annexes (“Modern land use”, “Soil types”, “Species and biotopes importance for conservation of biodiversity”, “Conflicts and hazards”, “Integrated concept of objectives and measures”) at a scale of 1:10,000. This document contains data and expert assessments on all components of the environment within the local community area as well as information about existing and potential conflicts in nature use, development objectives and measures, and opportunities for cooperation with the administration of the Kaniv Biosphere Reserve, in case of its establishment.

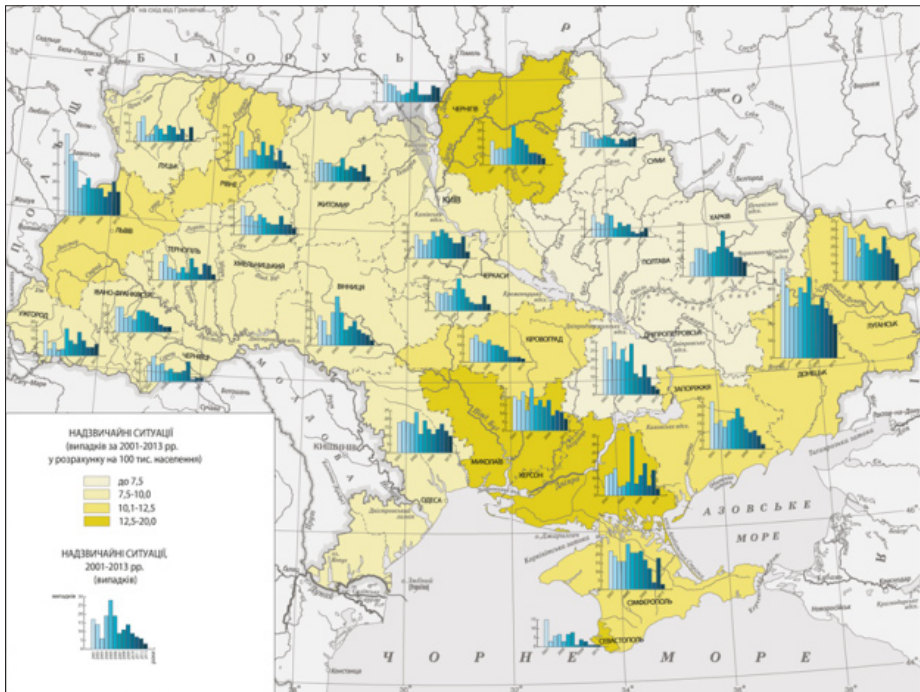
## **4 Atlas of Natural, Technological and Social Hazards and Emergency Risks in Ukraine**

In the context of this Atlas, the territory of Ukraine was considered a typical example of unstable regional development, largely caused by effects of large-scale unsustainable and extensive use of natural resources, which has lasted for centuries. There are about 15,000 potentially dangerous objects and about 800 million tons of wastes produced annually. The total deposits of such wastes are about 36 billion tons. Many of them are chemically hazardous. The factors of depreciation of enterprises’ fixed assets, which often reach 90% and obsolete industrial technologies are also dangerous (THE STATE EMERGENCY SERVICE OF UKRAINE 2013).

Thus, the need for this Atlas stems from the gradual increase in the number of emergency situations, their scale and the complexity of effects. According to different

evaluations, about 200-300 emergency situations (ES) happen annually in Ukraine on different levels: national, regional and local (Fig. 4).

Figure 4: **Emergency situations dynamics in Ukraine (2001-2013)** (Authors: RUDENKO L., POLIVACH K.)



Cartographic representation of the spatial distribution of hazards and risks is an important tool of geographic forecasting for ES prevention in Ukraine. The merger of traditional cartographic modelling with database structures forms a new research object, which should be studied from the geo-informational, cartographical and geographical points of view. Creating geographic databases for the purpose of mapping ES risk in Ukraine is one of the priority research areas.

The development of the Atlas of ES aims to generalise ideas about the probability of ES occurrence to ensure the availability of visual perception and analysis of such information for a wide range of users, including representatives of state and local authorities, teachers, scientists, NGOs, the public and international community.

To achieve this goal, developers of the Atlas's of ES pilot version completed a number of tasks including:

- Developing databases of potentially dangerous phenomena, objects and processes that are (or may be) the driving factors in shaping ES risk;
- Elaboration of spatially arranged cartographic models on risks of natural, technological, environmental, social, medical and biological occurrence of ES;
- Creation of an electronic atlas that promotes an assessment of factors, which may cause ES in Ukrainian regions.

Realisation of this goal allowed for the creation of the Ukraine Atlas of ES (electronic version), which contains 145 maps, structured in six chapters, with explanatory texts (Table 2).

Table 2: **Structure of the Atlas**

<b>Introduction</b>		
<b>Preconditions of potential emergencies</b>	Natural conditions	
	Social and economic state	
	Territories' contamination as a result of the accident on Chernobyl Nuclear Station	
<b>Hazard of potential deterioration of the population living conditions and enterprises' work</b>	<i>Chapter I Natural hazards and risks</i>	Arising from: <ul style="list-style-type: none"> <li>- land surface processes</li> <li>- adverse meteorological phenomena</li> <li>- natural biotic factors</li> </ul>
	<i>Chapter II Technogenic hazards and risks</i>	Arising from: <ul style="list-style-type: none"> <li>- industrial concentration</li> <li>- state of housing</li> <li>- waste accumulation</li> </ul>
	<i>Chapter III Social hazards and risks</i>	Arising from: <ul style="list-style-type: none"> <li>- political and ethnic structure of society</li> <li>- concentration of population</li> <li>- depopulation</li> <li>- population living conditions</li> <li>- level of population's social stability</li> <li>- morbidity</li> </ul>
	<i>Chapter IV Emergencies in Ukraine</i>	<ul style="list-style-type: none"> <li>- Emergencies' chronology (2000-2013)</li> <li>- Infrastructural provision of emergencies' response</li> <li>- Costs and damages from emergencies</li> </ul>
	<i>Chapter V Emergencies prevention</i>	<ul style="list-style-type: none"> <li>- Natural environment conservation</li> <li>- Organisation of the emergencies prevention and response system</li> </ul>

The Atlas' pilot edition in its electronic form is an important source of spatial and systematic interpretation of knowledge about preconditions of ES origin, contributing to the development of preventive measures, informing citizens about the probability of emergencies in their area, giving opportunities for assessment of deviations from regular parameters of natural or technical objects, threat of their destruction, loss of life or worsening of living conditions, direct and indirect material damage, deterioration of nature components.

## **5 Conclusions**

Many problems in Ukraine need long-term solutions. Adaptation of international standards in science and education, competitiveness improvement, transition to sustainable production and consumption will take decades. However, the high correlation between successful economic development and the use of new technologies is especially valuable for the implementation of sustainable territorial management principles.

Projects such as those described above are virtual bridges to the future for Ukraine. They aim to overcome gaps in obtaining and utilising spatial information at different levels and improve the methodology of mapping and spatial planning. Among their main integral outputs are the following:

- significant and comprehensive databases
- expert views
- interdisciplinary platforms
- sustainable and innovative methodology and approaches
- willingness for practical implementation

## **6 References**

BUNDESAMT FÜR NATURSCHUTZ (ed.) (2012), *Vilmer Visionen 2012 – Perspektiven und Herausforderungen für die Landschaftsplanung als Beitrag zu einer nachhaltigen Landschaftsentwicklung*. Ergebnis des Expertenworkshops vom 14. Bis 16.05.2012 im Bundesamt für Naturschutz – Internationale Akademie Insel, Vilm <[www.bfn.de/fileadmin/MDB/documents/themen/landschaftsplanung/vilmer\\_visionen\\_2012\\_barrierefrei.pdf](http://www.bfn.de/fileadmin/MDB/documents/themen/landschaftsplanung/vilmer_visionen_2012_barrierefrei.pdf) > (accessed 10 March 2015)

BUNDESKANZLERAMT ÖSTERREICH (ed.) (2000), *Guiding Principles for Sustainable Spatial Development of the European Continent*. Spatial development measures for different types of European regions <<http://www.bka.gv.at/DocView.axd?CobId=4747>> (accessed 10 March 2015)

- GERMAN FEDERAL AGENCY FOR NATURE CONSERVATION (ed.) (2002), Landscape planning for sustainable municipal development. Leipzig.
- HAAREN C.V (2004), Landschaftsplanung. Stuttgart, Ulmer.
- HEILAND S. (2010), Landschaftsplanung. In: HENCKEL D. et al. (ed.), Planen – Bauen – Umwelt. Ein Handbuch, pp. 294-300. Wiesbaden <[https://www.landschaft.tu-berlin.de/fileadmin/fg218/Publikationen/2010\\_Heiland\\_LaPla\\_Planen-Bauen-Umwelt-Handbuch.pdf](https://www.landschaft.tu-berlin.de/fileadmin/fg218/Publikationen/2010_Heiland_LaPla_Planen-Bauen-Umwelt-Handbuch.pdf)> (accessed 5 March 2015)
- HEILAND S., MAY A. (2009), Landscape planning in Germany – a tool for preventing of ecological problems of the territory. In: Ukrainian Geographical Journal, 4, pp. 3-10.
- INSTITUTE OF GEOGRAPHY, RUSSIAN ACADEMY OF SCIENCES (ed.) (2006), Landscape planning and nature protection: German-Russian-English Glossary. Irkutsk, Institute of Geography RAS.
- MINISTRY OF ECOLOGY AND NATURAL RESOURCES OF THE UKRAINE (ed.) (2015), Ukraine's National Report "On the State of Performance of "Agenda XXI" provisions for the period 2002-2012" <[www.menr.gov.ua/docs/activity-ecopolit/Nacdopovid2012.doc](http://www.menr.gov.ua/docs/activity-ecopolit/Nacdopovid2012.doc)> (accessed 10 March 2015)
- RUDENKO L., BOCHKOVSKA A., KOZACHENKO T., PARHOMENKO G., RAZOV V., LYASHENKO D., CHABANYUK V. (2007), The National Atlas of Ukraine. The scientific fundamentals of creation and their implementation. Kyiv, Akadempriodika.
- RUDENKO L., DRONOVA O., LYASHENKO D., CHABANYUK V. (2010), Concept of natural, technological and social hazards and emergency risks in Ukraine atlas creation. Kyiv.
- RUDENKO L., MARUNIAK EU. (2012), Landscape Planning and its Importance for Sustainable Spatial Development of Ukraine <<http://ukrgeojournal.org.ua/sites/default/files/UGJ-2012-1-03.pdf>> (accessed 6 March 2015)
- RUDENKO L., MARUNIAK EU., GOLUBTSOV O., LISOVSKY S., CHEKHNIY V., FARION Yu. (2014), Landscape planning in Ukraine. Paper presented in Kiev.
- RUDENKO L., MARUNIAK EU., GOLUBTSOV O., LISOVSKY S., CHEKHNIY V., FARION Yu. (2013), Landscape planning in Ukraine: The First Landscape Planning Program. In: Geography, environment, sustainability, 4, 6, pp. 91-101 <[http://www.rgo.ru/sites/default/files/gi413\\_web.pdf](http://www.rgo.ru/sites/default/files/gi413_web.pdf)> (accessed 10 March 2015)
- Seventh meeting of the Workshops of the Council of Europe for the implementation of the European Landscape Convention (= European spatial planning and landscape, 89) <[https://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/Publications/ATEP-89\\_bil.pdf](https://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/Publications/ATEP-89_bil.pdf)> (accessed 11 March 2015)
- THE STATE EMERGENCY SERVICE OF UKRAINE (2013), National Report on the state of technological and natural security in Ukraine in 2012. Kyiv <<http://children.mns.gov.ua/content/nasdopovid2012.html>> (accessed 11 March 2015)