# Role of Technogenic Risk Assessment in Spatial Planning System

Janis Ievins<sup>1</sup>, Janis Bartusauskis<sup>2</sup>, <sup>1-2</sup>Riga Technical University

Abstract. Nowadays, when urbanization has reached great amounts and to answer public desires and needs extensive infrastructures have been developed, it is crucial to identify and prevent possible technogenic environment risks that may threaten the environment and the society. Due to the fact that technogenic environment risks could create serious consequences, as well as its exposure is short or long term, preventive measures should be taken already at the beginning of spatial planning.

This research is directed to investigate manifestation of technogenic environment risks in legislation of spatial planning processes and systems, as well as giving a better understanding of Laws, Regulations and Directives in this field.

*Key words:* technogenic environment risks, spatial planning, legislation.

#### I. INTRODUCTION

Important technogenic environment risk reduction aspect is the understanding of the harmful effects and the availability of evaluation methodology which is easy in use.

Therefore legislation must be found in the field of technogenic risks assessment, so first of all the EU Directives will be overviewed in the article, starting with DIRECTIVE 2011/92/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment. This Directive gives a lot of valuable information and suggestions for project assessment which are mentioned in ANNEX I, II, III and IV, the given information is precise and allows better understanding of criteria which are used to determine potentially hazard projects. [1]

Another important document is Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.

"The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment." [2]

In accordance with Article 3, the key task of the strategic environmental assessment (SEA) is the assessment of the "significant effects on the environment, including issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, including architectural and archaeological heritage, landscape and the interrelationship between the above factors" [2]. It mean that risk assessment is an important aspect in the EU legislation system; next issue concerns methodology used in risk assessment.

Precise research in the field of risk assessment during spatial planning can be found in the European Spatial Planning Network Project ESPON2006, to be more precise in "The Spatial Effects and Management of Natural and Technological Hazards in Europe - ESPON 1.3.1", part "Spatial Effects of Natural and Technological Hazards". The report represents extensive information about nature and technological hazards in the EU. During the mentioned research, most important hazards in technological sphere were pointed out - air traffic accidents, major accident hazards (chemical plants), nuclear power plants, oil processing, transport and storage. Another important thing that was mentioned in research regarding risk assessment was that risk management in relation to spatial areas in most cases faces the problem of dealing with multiple hazards. Multi-hazard cases can be described as settings, where a multitude of hazards needs to be included in risk assessment of a certain area. A multi-hazard perspective is essential for all those stakeholders who have to consider the entirety of risks and who at the same time are responsible for a certain area.

Institutions and persons dealing with spatially relevant risks planning authorities (regional planning, spatial are comprehensive land use planning), insurance and reinsurance companies and emergency response managers. Whenever a multitude of hazards has to be considered in risk management, the question of weighting the relevance of certain hazards arises. The answer is not necessarily easy to reach because all normatively determined weighting factors face the same problem: due to lack of impartial and scientifically justified data, it is methodologically hardly possible to justify any of the weighting factors. The main reason is caused by the fact that besides the impartial risk analyses 'risk' also depends on certain values that are societally determined. Accordingly, risk cannot only be discussed on a factual level. Therefore, it is of greatest interest to find a certain form of weighting in risk assessment.

"Hazards usually do not respect political boundaries, also vulnerability and resulting risk patterns are difficult to produce on man-made limitations." [3]

To better understand the situation in spatial planning as well as risk assessment methods used in Latvia, it is important to study the legislation system.

Developing research about legislation in the field of spatial planning in Latvia, many aspects can be found which

are associated with technogenic environment risks, but there is a lack of easy-to-find and manageable methods for their detection.

"A spatial plan is a long-term spatial planning document or a set of planning documents which has been developed and has come into effect in accordance with procedures set out in regulatory enactments and which in conformity with the planning level and the type of plan reflects the present and planned (permitted) utilisation of the territory and the restrictions on the utilisation of such territory both in writing and graphically." [4]

At present spatial planning in Latvia is developed for a period of 12 years.

To better understand the spatial planning in Latvia, it is necessary to research legislation in this field.

Spatial planning in Latvia is implemented on the following planning levels:

1) national level — a national level spatial plan is the National Spatial Plan, which sets out all national interests and requirements for the utilisation and development of the territory of the state;

2) planning region level — in a planning region spatial plan the development possibilities, directions and restrictions of the planning region territory are specified;

3) district local government level — in a district local government spatial plan, the development possibilities, directions and restrictions of the district local government territory, the present and planned (permitted) utilisation of the district local government territory are graphically represented, as well as details of the requirements, territories and objects specified in higher level spatial plans are specified; and

4) territorial local government level — in a territorial local government spatial plan, the development possibilities, directions and restrictions of the territorial local government territory, the present and planned (permitted) utilisation of the territorial local government territory are graphically represented, as well as detailed requirements, territories and objects specified in higher level spatial plans are specified. [4]

Considering the Spatial Planning Law in Chapter I, Section 3 and Sub-point 1 represent the principle of sustainability, which would ensure a qualitative environment, balanced economic development, rational utilisation of natural, human and material resources, development and preservation of the natural and cultural heritage for the present and next generations, as well as Sub-point 3 represents the principle of diversity, which would ensure that in the development of a spatial plan the diversity of nature, the cultural environment, human and material resources, and economic activity is taken into account and the Sub-point 7 represents the principle of openness, which must ensure that a spatial plan is developed by involving the public and ensuring the openness of information and decision taking. [4]

The Section 4, Sub-point 4 of this Law specifies tasks of spatial planning which could be closely connected with reducing of technogenic risk implementation and noxious consequence and these tasks are: "to create pre-conditions for ensuring environmental quality and rational utilisation of the territory, and the prevention of industrial and environmental risks" [4], but it should be noted that there is no assessment and monitoring methods given, in general, principles and objectives of the law are focused on the development; however, it would require more explicit references to the regulations of the Cabinet of Ministers which could help to ease law adaptation. Accordingly, Sub-point 7 in Section 4 specifies the following tasks: "to preserve the natural and cultural heritage, landscape diversity and biological diversity, as well as to improve the quality of the cultural landscape and populated areas" [4]; it would be worth mentioning the negative effects of anthropogenic factor impact on the people and the landscape in general.

Principles and objectives given in the Spatial Planning Law are clear; however, some difficulties appear. related to finding a regulatory framework that could help to achieve its goals; therefore, further search in the associated regulations of the Cabinet of Ministers is needed.

Regulation No. 770 of the Cabinet of Ministers "Regulations for District Local Government Spatial Planning" could bring more information about measures needed to be taken to prevent technogenic risks. These regulations give more information about arrangements which could facilitate to reduce risk; however, they are very general and do not give precise regulations or methods.

In the context of technogenic risks, the section of the determining territory utilisation requirements must be taken into account in district and local government spatial planning, such as: "Sub-points 4.8. high-risk areas and objects, 4.18. the objects referred in Annex 1 to the Law On Environmental Impact Assessment" [5], [6]. During research conducted to find out the appropriate legislation, this is the first law where precisely defined objects with industrial quantities can be found, but any references to regulatory provisions which provide information on the permissible norms and requirements for risk areas or objects in the Annexes cannot be found. Sub-paragraph 19.3.3, regarding graphical section, only determines that protective zones, the width of which is 100 metres or more, must be included, but there are not additional requirements set for high risk objects. It should be admitted that the inclusion of such objects into the graphic part of spatial plan would be desirable as it would provide information about the risk level for objects located in a given area and whether they affect long-term planned development patterns.

To obtain more detailed information, it is necessary to examine the Regulation No.1148 of the Cabinet of Ministers, Regulations for Self-Government Spatial Planning. In accordance with these regulations, local planning areas should be considered: 4.7. risk areas and objects – this section should include requirements not only for separate risk objects, but also high ecological risk areas, risk areas of geological processes (flood, wind erosion, landslides, landslip areas, karst, bogging, etc..), as well as other problematic areas (visually polluted, unmanaged, etc..) and Paragraph 4.11. referred object areas which placement, in accordance with laws and regulations, are subject to special requirements or which need an environmental impact assessment, and industrial areas, with increased pollution to the environment, noise or other disturbances, which are harmful to the environment and people; the paragraph should include requirement protection against vibration, odours, etc. [7], [8]

Currently, this section is governed by Civil Protection Law [9], Law on Environmental Impact Assessment [6], Regulation No. 597 of the Cabinet of Ministers "Procedures for Environmental Noise Assessment" [10], Regulation No. 1031 of the Cabinet of Ministers, regarding Latvian Construction Standard LBN 007-10 "Harmlessness Requirements for Structures" [11], Regulation No. 532 of the Cabinet of Ministers regarding the Procedures for Industrial Accident Risk Assessment and Risk Reduction Measures [12], Regulation No. 423 of the Cabinet of Ministers "Order on Development and Approval of Civil Protection Plan and Its Structure for Self-Governments, Merchants and Institutions [13], Regulation No. 626 of the Cabinet of Ministers regarding Criteria for the Specification of Objects of Increased Danger and the Duties of the Owners (Possessors, Managers) of Such Objects for Ensuring Measures for Reduction of Risk [14] and they are not the only ones; the question arises - whether application of many different types of regulations will ease assessment and reduce the risk.

During spatial planning process, information can be requested from other institutions, such as Regional Environmental Department, Health Inspectorate, State Fire and Rescue Service, Nature Conservation Agency, which complicate planning process because assistance of at least three experts will be needed.

Graphical part of the local government spatial plan requires to display protection zones and risk areas; it would be an important aspect of picturing risk areas and hazardous objects to determine them in long term. Accordingly, the local government spatial plan should include an environmental report and the opinion of the competent authority, environmental review in accordance with the law "On Environmental Impact Assessment", and the public consultation [7], it is important to inform the public about possible technogenic risks, because in future society may request reasonable actions from municipality in current and future projects, overall giving spatial planning even a greater practical importance.

### II. TECHNOGENIC ENVIRONMENT RISK DESCRIPTION IN RELATION TO ENVIRONMENTAL FACTORS

Most substantial issues are linked to insufficient reflection of the various environmental risk factors (air quality and noise, planning of traffic flow, geological risks, flood risks, industrial accident prevention measures.) in planning documents of other departments.

# Environmental noise

Legislation has been drafted in the area of environmental noise in compliance with the EU requirements by setting forth specific tasks for drafting noise maps and an action plan for

noise reduction. These maps and action plans must be reviewed every 5 years. [10] The noise maps have to reflect the effects of road, railway and air traffic and industrial sites via specific values of noise indicators, exceedance of noise pollution, number of persons being affected by the noise in the particular area. Local governments draft maps and action plans for agglomerations, while the Ministry of Transport - for roads, railroads and airports. In 2008 a strategic noise map was drafted for the agglomeration of Riga, including Riga City, Baloži town, part of Jūrmala town and amalgamated municipality of Salaspils, amalgamated municipality of Stopiņi, as well as areas of rural municipalities of Babīte, Garkalne, Mārupe and Olaine; noise maps were also drafted for five road sections with traffic intensity of more than 6 million vehicles per year. This map shows the noise level during the day, evening and night. [8]

During the process of spatial planning, it would be necessary to consider potential noise of production plants, highways, airfields and other objects, using local and international experience. In this context, it would be necessary to develop a specific government policy in order to identify the number of people affected by noise and determine measures for noise reduction or if the permissible level is not exceeded, maintenance that noise level will not rise in future.

# Quality of inland waters

In compliance with legislation and taking into account the ecological typology of Latvian rivers and lakes, their anthropogenic loads and role in the national economy and nature protection, as well as other significant factors, data on 207 river and 262 lake water bodies (which is the basic basin management unit) identified within the river basin districts were presented in the reports referred to in the Article 3 and Article 5 of the Water Framework Directive that were forwarded to the European Commission in 2004 and 2005. The reports comprise evaluation of potential risks that could impede the achievement of environmental quality objectives and emphasise that despite the limited impact of nutrients and pollution identified in almost 4/5 of all surface water bodies, in general the condition of Latvian inland waters can be regarded as relatively good. [8]

# Polluted sites

The polluted and potentially polluted sites have been identified, and they have been included in the register of polluted and potentially polluted sites that can be found in the Latvian Environment, Geology and Meteorology Centre database. Overall, 3,562 polluted and potentially polluted sites were examined and included in the register of polluted and potentially polluted sites, 242 of which were recognized as polluted. The register provides a general insight into the country's situation, as well as information required for spatial planning. If assessing the register based on the spatial planning requirements, it might be stated that the register is rather general and does not provide accurate information for spatial development planning; therefore it is required to update the register by engaging local governments in this work. [8]

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#### Management of chemical substances

Management of chemical substances is of high priority both at global and the EU level; however, at various different levels the Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (hereinafter - REACH) has to be implemented in the EU Member States, while in the rest of the world efforts are made to implement the legally non-binding Strategic Approach to International Chemicals Management (hereinafter - the SAICM), so that risks in chemical sector would be reduced also in the developing countries, inter alia allowing for possibilities of better identification and control of transboundary water and air pollution. In order to achieve objectives set forth in the REACH Regulation, a close cooperation among the institutions involved in implementation of this Regulation is required at both national and the EU level.

The REACH together with the SAICM combine the potential future market sanctions against countries that are producers of chemical substances and pharmaceuticals and that have by then failed to solve the problems related to management of chemical substances, imposing these sanctions through the World Trade Organisation. Latvia successfully carries out measures for implementing the REACH, but regarding implementation of the SAICM more information is required on safe and controlled circulation of chemical substances in the neighboring countries, for such information would allow reducing significantly the costs associated with transboundary monitoring of priority substances. [8]

### Climate change and its causes

Along with the increase in temperature, glaciers will melt faster, the level of water in the world's oceans will rise more rapidly, also the number and scale of extreme and uncharacteristic natural phenomena (e.g., storms, floods, spells of great heat or coldness, long drought, etc.) will increase, thus having significant deteriorating effects on nature, the manmade environment, national economy, human health and safety.

Scientists forecast more frequent and heavier storms with increased wind velocity, thus incurring losses in populated areas, as well as increasing the technogenic risk implementation possibility. Severe drought and strong winds significantly increase the forest reaction to fire and the possibility of forest fires. Thus, the artificially restored forest plantations suffer from extreme natural conditions.

### III. DESCRIPTION OF THE SITUATION REGARDING REDUCTION IN ACCIDENT RISKS

In Riga, Ventspils, Rēzekne, Daugavpils and other towns and districts, there are dangerous sites where activities involving hazardous chemical substances and chemical products – their storage, production, use, transportation, collection, destruction or recycling – are carried out. In case of industrial accidents these sites can have a more or less serious adverse effect on the environment and population in the territory of towns and populated areas where these sites are located. Pursuant to the Regulation No. 626 of the Cabinet of Ministers "Criteria for Identification of High-Risk Sites and Duties of the Owners (Holders, Managers) of Such Sites to Ensure Risk Reduction Measures" adopted on 18 September 2007, dangerous sites posing threats to the environment and human health are defined as high-risk sites. Not always identification and prevention of accident risks is carried out through optimum cooperation among the government institutions and business operators involved. [8]

Main problems calling for implementation of a specific government policy:

1) Entrepreneurs do not have sufficient experience in carrying out necessary activities for implementation of the REACH Regulation which could affect competitiveness of the relevant Latvian companies in European and other markets. The bureaucratic framework places an additional administrative burden on businesses.

2) In some areas, there is still inadequate information, control and cooperation among institutions regarding circulation of chemical substances in some of its stages, as well as regarding their potential harmful effect on the environment and health. [8]

3) Species and habitats are being considered in isolation from the area's economic development.

4) It should be noted that there are not any measurements made regarding vibration impact on inhabitants' health and environment.

Fulfilment of the objectives established in the Strategy will have positive effects also on the objectives for improvement of environmental quality established in the midterm development planning documents. Environmental issues are defined in all policy planning documents for development of planning regions; therefore lines of action set forth in the Strategy comply with solutions of problems found in regional development programmes and strategies.

According to the National Development Plan of Latvia 2007–2013, one of the pre-conditions for safe and balanced development is reasonably used and well-preserved natural environment; but one of the tasks to be carried out (Task 6) is to facilitate assessment, mitigation and monitoring of the natural risks, including climate change and industrial risks.

Identification of climate change related risks and implementation of their management is envisaged by the informative report "On Adapting to Climate Change" (approved by Protocol Decision No. 56 of the Cabinet of Ministers as of 5 August 2008) prepared by the Ministry of Environment, and these issues will be included in the next concept on adaptation to climate change, providing for a number of corresponding amendments to the legislation. Therefore the local government level is of particular importance regarding adaptation to climate change. At this level, the most accurate information on local nature and people's living conditions, as well as on conditions unfavourable or favourable for environmental change in relation to development of the respective territory, higher risk sites, etc. is available. [8]

Nevertheless, at the moment the mutual coherence of various levels of spatial planning and coordination during their development is poor.

When drafting documents for development of planning regions, cities and amalgamated municipalities, objectives and actions stipulated in regional waste management plans and plans for management of river basin districts have to be taken on board.

The overall objective of the Environmental Policy Strategy is to form a basis for preservation and restoration of environmental quality, as well as for sustainable use of natural resources, while at the same time limiting the impact of hazardous environmental factors on human health. [8]

Planning documents of other sectors insufficiently describe various environmental factors – environmental quality and noise for planning of traffic flows, geological risks, flood risks, measures for prevention of industrial accident risks, to encourage integration and emphasizing of environmental issues in the policies of other sectors. [8]

#### IV. ISSUES RELATED TO ASSESSMENT OF TECHNOGENIC RISKS IN SPATIAL PLANNING PROCESS

The European Commission believes that the most effective way of improving the quality of new policy proposals is by making those people who are responsible for policy development also responsible for assessing the impact of what they propose.

To this end, the Commission has rolled out a wide-ranging impact assessment system. It is based on an integrated approach which analyses both benefits and costs, and addresses all significant economic, social and environmental impacts of possible new initiatives. [15]

During research of regulation documents regarding spatial planning in Latvia, conclusions related to aspects of technogenic risks can be made: it is not easy to find associated regulations, often they are very general and there are gaps in the current legislation. Currently, the law does not separate the planning of densely populated areas (towns and villages) from rural land use planning; it should be a different level of detail and actions, often in both cases – urban and rural areas are estimated at the same level of detail.

When forming large regions, covering urban and rural areas, including regions, where one district council forms a region, it is necessary to identify in legislative framework opportunities to develop individual spatial plans of towns and villages and general development conditions for rural areas, with the possibility in region plan of land use to draw up certain parts of the region areas – such as cities, villages, or rural areas to develop individual plans, which can gradually replace the existing spatial plans for region areas. [16]

Requirements and restrictions for the establishment of protection zones are determined in more than 27 various laws and regulations, which complicates the understanding of these rules. Protection Zone Law [17] regulates different types of protection zones, protected areas, and protection strips, which are specified; the types of protection zones and the functions; the basic principles for the establishment of protection zones; restrictions of economic activity in protection zones

As described in the Sections 35 and 59 of the Protection Zone Law, all types of protection zones shall be determined in territorial local government spatial plans pursuant to the requirements of regulatory enactments.

There are series of regulations of the Cabinet of Ministers governing requirements for determination of specific protection zones.

General restrictions in protection zones shall be determined by laws and regulations of the Cabinet of Ministers, they may also be prescribed by the binding rules of the local governments issued within the scope of their competence. [17] At the same time, majority of the protection zones is of fixedwidth parameter, especially in engineering utilities. Thus, these zones are not planned, but set with methods of calculation.

Regulation No. 157 of the Cabinet of Ministers "Procedures for Carrying Out a Strategic Environmental Impact Assessment" [18] sets requirements for notifying processes of society, organizations and institutions, during environmental account process, as well as informing public after the planning document is adopted.

To understand how the regulatory framework now really affects processes of spatial planning, legislative review is required, by analysing content from point of view of crosscompliance and their impact, content of regulations, their feasibility and potential consequences, and harmonization. [16]

More pronounced priorities and specialization are needed at all levels (government, region and local governments) especially at the government level.

The Ministry of Environmental Protection and Regional Development has commissioned a separate study to establish the general content of the Building Regulations, which will be uniform across the country, with the aim of simplifying the content of current spatial plans and united type of land utilization classification, which will be used in planning and for promoting a joint information system. It has to be admitted that this study is at the proposal stage, and should be discussed. [16]

# V. CONCLUSIONS

Long-term and medium-term spatial planning documents need to be developed based on an integrated approach. An integrated approach requires a variety of areas – social, economic, environmental and other dimensions – to link together the temporal and spatial dimensions, ensuring the interests of consistency across all levels of government and stakeholders. "Whole is more valuable than the sum of its parts." [16]

Planning co-operation – by choosing this approach, different views and argument formulation will be explored, to determine the direction of development strategy, which later

will provide development and implementation of sub-planning documents. Negotiations will build a base for general understanding and cooperation, which can be used in dealing with conflict situations in future.

Planning must be done from the whole to the particular – understanding that each specific location (territory) is not an isolated plot or house, but an extensive and more complex structure.

Space is three-dimensional and reproduces at the micro level (street, neighborhood), meso level (local government) and macro (regional). Formative section of the plan describes the existing spatial structure in its wider context (macro level), in the plan area (meso level) and for each spatial entity within the area (micro level). Creative collaboration between these three levels is more important than working with each of these levels separately. [16]

More detailed planning for cities and villages would be required by developing spatial plans for cities and villages, or part of them, which includes restrictions on development, transport schemes and zoning of permitted use, incorporating public space, recreation areas, building areas, production and transport infrastructure, where detail exposure levels will be set by the task.

Spatial planning documents should also include a 3D (three dimensional) technologies for development of spatial areas (building), composition, modelling, such as building height, terrain features, etc. At this level of detail, better determination can be done regarding perspective of waste water, electricity and communications solutions.

Territory use and building regulations need to include requirements for each type of zoning and, if necessary, special conditions, such as the coastal zone, green areas, public space, etc. [16]

Process of spatial planning must be based on knowledge about general relationship between manifestations of natural processes and impact characteristics of human activities. It is very difficult to form a concept of the future environment, with limited knowledge about development of the potential region and specific local government, and limited information on trends and forecasts. [16]

It is necessary to develop an integrated system of indicators, which would be easy to use during spatial planning in order to define the possible number of potentially hazardous facilities and options for facility installation in future.

Also it is necessary to develop a territorial monitoring system for Latvia, in order to gain a general overview for various areas of development trends and projections, individual sectorial policy impacts and consequences. In this connection, a systematic study for identification and clarification of the spatial development indicators and typologies is needed, as well as creating additional territorial statistical units at the lower planning levels.

During the process of spatial planning, some of regions adopt the European Spatial Planning Observation Network list of relevant indicators and typologies, which is formed from the ESPON 2006 programme. [19] Further work on risk assessment will be done in ESPON2013 applied research as showed in Programme – Territorial development and competitiveness of regions, urban and rural teritories (V.2.1. a.)

It should be noted that during the process of spatial planning it would be necessary to attract professionals trained in the fields of labour safety, civil defence and environmental issues, thus being able to make effective proposals on reducing technogenic risks.

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Janis levins is the Professor and also the Head of the Institute of Labour Safety and Civil Defence at the Faculty of Engineering Economics and Management, Riga Technical University.. In 1993 he was awaded the Degree of Doctor in Economics (Dr.oec.) by Riga Technical University. He delivers lectures in work safety, management and economics. He specialises in work safety and economic aspects of labour protection, as well as risk assessment. He is the Ambassador of the European Network Education and Training in Occupational Safety and Health (ENETOSH).

1/7-118, Meza Street, Riga, LV-1048, Latvia. E-mail: <u>Janis.levins@rtu.lv</u>, mob. ph.: +37129272394

Janis Bartusauskis is the lecturer and the Head of Civil Defence Laboratory of the Institute of Labour Safety and Civil Defence at the Faculty of Engineering Economics and Management. Riga Technical University, He obtained the Master's Degree in labour safety in 2007 at Riga Technical University. He delivers lectures in the field of work safety. He specialises in work safety and aspects of labour protection, as well as risk assessment.

Adderss: 1/7-117, Meza Street, Riga, LV-1048, Latvia. E-mail: <u>dcai@rtu.lv</u>., mob. ph.: +37122023337

#### Jānis Ieviņš, Jānis Bartušauskis. Tehnogēno risku novērtēšanas loma reģionālās plānošanas sistēmā

Mūsdienās, kad plaši attīstās urbanizācija un sabiedrības vēlmju un vajadzību nodrošināšanai nepieciešama plaša infrastruktūra, ir svarīgi apzināt un novērst iespējamos tehnogēnās vides riskus, kuri var apdraudēt gan apkārtējo vidi, gan sabiedrību kopumā. Sakarā ar to, ka tehnogēnās vides riski var radīt nopietnas sekas, gan iedarbojoties īstermiņā, gan arī ilgtermiņā, ir jāveic preventīvo pasākumu plānošana, iekļaujot tos teritorijas plānošanas pirmsākumās.

Svarīgs tehnogēnās vides risku samazināšanas aspekts ir izpratne par to kaitīgo ietekmi, kā arī novērtēšanas metodikas pieejamība un tās pielietošanas vienkāršums.Šis darbs tika vērsts uz tehnohēno vides risku atspoguļojuma izpēti reģionālās plānošanas procesos un sistēmā, kā arī lai lasītājiem sniegtu labāku izpratni par likumiem, Ministru kabineta noteikumiem un direktīvām, kas varētu būt saistošas risku novērtēšanas jomā.

Avāriju risku identificēšanā un novēršanā ne vienmēr ir optimāla sadarbība starp iesaistītajām valsts institūcijām un komersantiem.

Kopumā, apskatot teritoriālo plānošanu reglamentējošos dokumentus, nākas secināt, ka ar tehnogēno risku saistītos noteikumus nav viegli atrast un bieži tie ir ļoti vispārīgi, kā arī bieži var sastapties ar nepilnībām esošajā likumdošanā.

Teritoriju plānošanā jāiesaista speciālistus, kuri būtu izglītoti gan darba, gan civilās, gan vides aizsardzības jautājumos, līdz ar to spētu dot efektīvus priekšlikumus tehnogēno risku mazināšanai.

#### Янис Иевиньш, Янис Бартушаускис. Роль оценки техногенных рисков в системе регионального планирования

В настоящее время широкое развитие урбанизации и общественных желаний нуждается в обширной инфраструктуре. В связи с этим важным является выявление и предотвращение возможных техногенных рисков, которые могут угрожать окружающей среде и обществу в целом. В связи с тем, что техногенные риски могут иметь серьезные последствия, как в случие краткосрочного, так и в долгосрочного влияния, в начале планирования области должны быть приняты превентивные меры по определению риска. Важным аспектом снижения техногенных рисков является понимание вредных последствий и доступность методологии оценки, а также простота в использовании методологии.

Эта работа была направлена на исследование отражения техногенных рисков в процессе и системах регионального планирования, а также, чтобы дать читателю более полное представление о законах, в правилах Кабинета министров и директивах, которые могут иметь отношение к оценке рисков.

В сфере выявление рисков аварии и профилактики не всегда полуцается оптимальное сотрудничество между государственными учреждениями и предпринимателами. В целом, оценивая документацию, регулирующую пространственное планирование, можно сделать вывод о том, что техногенные риски и связанные с ними нормативные акты не так легко найти, и часто они являются общими, также часто видны пробелы в действующем законодательстве.

Следует отметить тот факт, что для территориального планирования необходимо привлечь специалистов, которые будут обучены работе в гражданской обороне и охране окружающей среды, и таким образом будут в состоянии принимать эффективные предложения по снижению техногенных рисков.