

## ASSESSMENT OF LAND DEGRADATION FOR SUSTAINABLE DEVELOPMENT OF MUNICIPALITY TERRITORIES

Anda Jankava<sup>1</sup>, Dr. oec. Velta Parsova<sup>2</sup>, Dr.oec.; Maija Berzina<sup>3</sup>, Mg.sc.ing.; Dace Didrihsone<sup>4</sup>, Mg.sc.ing.; Dace Platonova<sup>5</sup>, Dr. oec.; Aina Palabinska<sup>6</sup>, Mg.oec.

<sup>1, 2, 3, 4, 5, 6</sup>Department of Land Management and Geodesy, Faculty of Environment and Civil Engineering, Latvia University of Agriculture

**Abstract.** The global economic growth results in the increase of intensity of land use, which is one of the main natural resources. The degradation processes of land and soil occur as a result of economic activities and natural conditions creating degraded territories. Restoration of degraded territories and degradation risk prevention is an important task of each local government for sustainable development of a territory. It is determined by international and national legislation. As regards land degradation risks and their prevention, the Law on Land Management has come into force on 1 January 2015, which defines the notion of land and soil degradation requiring local governments to depict such territories in their planning documents as well as land owners to prevent their lands from degradation. However, in spite of the law, land and soil degradation identification criteria have not been approved in Latvia, there is neither relevant degradation classification system, nor regulations of the procedure how to identify and evaluate the current degree of land degradation and its possibility, how to determine measures for soil degradation prevention. The aim of the research was to work out scientifically grounded recommendations for the procedure of identification of land and soil degradation, classification and evaluation of degradation processes in Latvia, which could serve as the basis for the design of the regulations of the Cabinet of Ministers in the framework of the Law on Land Management. The survey was carried out among senior staff members of competent public institutions and local governments. The survey found out the respondents' opinion regarding types of land degradation, degraded land territories, their identification and division, storage of information about the maintenance of brownfields.

**Key words:** land degradation, degraded territory, brownfields, sustainable development, municipality territory.

**JEL code:** Q24, R52

### Introduction

Land is a non-renewable resource with restricted accessibility; therefore, preservation of land's useful features as well as full and sustainable land use is of utmost importance. Economic activities are the main driving force of resource utilization. The global economic growth results in the increase of the intensity of land use, which is one of the main natural resources. The degradation processes of land and soil are observed as a result of economic activities and natural conditions creating degraded territories. The degraded territory is land which has been harmed by industrial and other kinds of activities or inaction to such an extent that its economically efficient use is impossible without special recovery measures.

The UN General Assembly on 25 September 2015 adopted a resolution "Transforming Our World: the 2030 Agenda for Sustainable Development" including seventeen sustainable development goals which cover economic, social and environmental dimensions. One of the aims

of environmental dimension is: "to restore degraded land and soil and strive to achieve a land-degradation neutral world". This document is one of the first worldwide documents to call for comprehensive and integral action.

The issue of sustainable growth has been included in the strategy "Europe 2020 –Resource-efficient Europe". It means that land should be managed by sustainable measures, but obstacles that hamper effective use of land should be removed. According to the strategy, soil recovery measures should be carried out until 2050 in order to reduce soil erosion and increase the amount of organic substances.

As regards Latvia, in the planning period from 2014 to 2020, the EU Regional Development Funding Programme is available to the local governments' national importance development centres. The aim of the funding programme is revitalization of territories, regenerating degraded territories according to the municipalities' integrated development

<sup>1</sup> Corresponding author. Anda Jankava Tel.: +371 29356448 E-mail address: anda.jankava@llu.lv

programmes (Regulation No 593 of the Cabinet of Ministers from 13 October 2015).

The above mentioned problem is defined at the international and European level and it is topical also in Latvia. The Law on Land Management has come into force on 1 January 2015 to deal with land degradation risks and their prevention. The Law on Land Management defines the notion of land and soil degradation requiring not only local governments to depict such territories in their planning documents but also land owners to prevent their lands from degradation. In addition, starting with 2018, the law prescribes that the government shall issue the land report once in five years, which is entitled to include the information about the degraded territories and their areas.

However, in spite of the adopted law, land and soil degradation identification criteria have not been worked out and approved in Latvia, there is neither relevant degradation classification system, nor a regulation of the procedure how to identify and evaluate the current degree of land degradation or its possibility taking into account the current and envisaged type of land utilization, as well as how to determine measures for soil degradation prevention.

The Law on Land Management describes obligations with regard to identifying and formation of these territories, as well as obligations with regard to their prevention. However, the unified criteria for identifying such territories have not been worked out and substantially specified; therefore, the measuring of degraded land in each municipality is very subjective and it is impossible to compare the measurements at the national level. Consequently, the situation has caused misunderstanding among land owners, local governments and the country's government.

Another point to consider is the risk of ineffective use of the financial support of local governments and the EU Regional Development Fund meant for investing money in the territories

which do not have the features of degraded land or which do not need prevention measures in the nearest future. Inefficient and inadequate spending of the EU financing could lead to financial corrections.

Researchers from Latvia and other countries have studied the problem of land and soil degradation and their impact on sustainable development, however, their attention is mostly paid to soil degradation, its influence and prevention measures (Klavins et al., 2008; Juozapaviciute, 2016; Parsova et al., 2016, Land Degradation, United..., 2017; Brabant, 2010). The point is that degradation process may affect not only agricultural land but also land in rural territories, towns and cities, and it may take various forms. Therefore, conditions and the level of degradation should be analysed.

The aim of the research is to work out scientifically grounded recommendations for the procedure of identification of land and soil degradation, classification and evaluation of degradation processes in Latvia, which could serve as the basis for the design of the regulations of the Cabinet of Ministers in the framework of the Law on Land Management.

To achieve the aim, the available literature regarding the types of land and soil degradation as well as its features was analysed. The authors of the research analysed legislative acts of the Republic of Latvia, depiction of brownfields in municipalities' spatial plans, studied international experience and interviewed competent executives in the public institutions of the Republic of Latvia (the Ministry of Agriculture, Ministry of Environmental Protection and Regional Development, State Plant Protection Service etc.).

The analysis of strategic planning documents of the Republic of Latvia, which has been issued according to the EU directives, has led to the conclusion that sustainable use of soil and land is one of the main aims. Sustainable use of soil and land is related to the necessity of recovery and

preservation. In addition, the attention in these documents is paid not only to long-term utilization of agriculture land as a resource, but also to revitalisation of degraded urban areas (Latvijas ilgtspējīgas attīstības..., 2010; Vides politikas pamatnostādnes..., 2014; Zemes politikas pamatnostādnes..., 2008).

As regards the research activities in Latvia, several studies have focused on land degradation process in order to highlight either a relatively new problem or develop sustainable urban development standards (Jackson, 2010; Degradēto teritoriju izpēte..., 2004; Petijums par degradēto..., 2012). The authors of the above mentioned studies claim that the formation process of brownfields in Latvia was similar to that of other Eastern European countries and some of Western European countries. The majority of brownfields were formed after the collapse of the Soviet Union. The process was influenced by the transition from planned economy to market economy and the changes in production. The most typical degraded areas include industrial and agricultural buildings and their infrastructure, abandoned military bases and surrounding territories, abandoned half-finished buildings. Therefore, the issue of degraded land in Latvia is very important since many questions should be answered as regards their identification and classification in particular.

The research method includes the survey of senior staff members of competent public institutions and local governments. The aim of the survey was to find out the respondents' opinion on types of land degradation, degraded land territories, their identification and division, information storage about the maintenance of brownfields.

The quantitative research method was used to prepare the questionnaire (mostly multiple choice questions, evaluation scales, answer stratification, avoidance of open-ended questions etc.). The number of respondents was 77, including 64 respondents from local government

offices, 6 respondents from government institutions and 7 respondents from non-governmental organisations. The respondents represented specialists of land ownership, land management, real estate, environmental management and territorial development planning, chairmen of councils of municipalities from different regions of Latvia. The state public institutions were represented by employees of "Environmental, Geological and Meteorological Centre of Latvia", "Latvian Geo-spatial Information Agency" and "State Environmental Service".

The survey questions were based on the following definition of **degraded territory** (included in the Law on Land Management, as of 1 January 2015): it is a territory with a destroyed or damaged surface of soil or an abandoned territory of a building site, mining site, a site of economic or military activity. The words "a destroyed or damaged surface of soil" in the definition refer to soil degradation, however, the part of the definition which mentions four types of abandoned territories refers to land degradation which is the subject matter of the survey. Consequently, degraded land could be divided into four types of unused areas:

- abandoned building site;
- abandoned mining site;
- abandoned site of economic activity;
- abandoned site of military activity.

The survey questions were related to identification of these territories, the criteria of identification, the division, as well as storage of the information about the degraded territories.

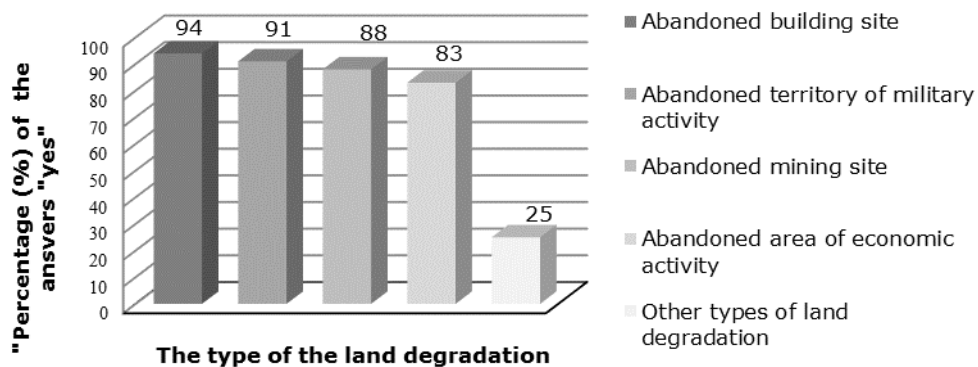
The questions in the questionnaire were formulated in such a manner that respondents had to give a positive answer "Yes", a negative answer "No" or "No answer" to questions, as for example, in the question regarding the types of land degradation: "Does an abandoned building site refer to one of the types of land degradation, according to the definitions given in

the Law of Land Management?". In addition, the respondents were given an opportunity to add other, previously not mentioned types of land degradation. Further questions required information concerning the necessity of more detailed division, identification, maintenance of degraded territories.

**Research results and discussion**

The results of the survey show that in respondents' opinion all given types of land degradation are relevant, since 72 respondents or 94 % considered an abandoned building site,

70 people or 91 % considered abandoned territory of military activity, 68 respondents or 88 % considered abandoned mining site and 64 respondents or 83 % considered abandoned area of economic activity as one of the types of degraded land (See Fig. 1). It is interesting to note that only 19 respondents (25 %) mentioned other possible types of land degradation, which included polluted areas with waste, chemicals, bogging, coastal erosion which could be included in the four offered types.

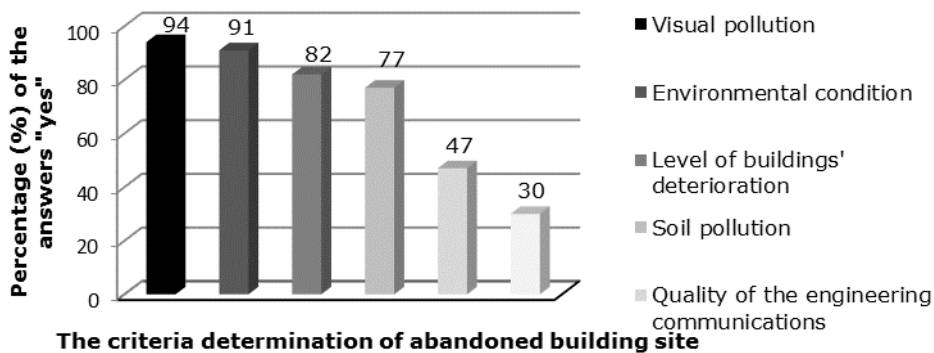


Source: the authors' calculations based on results of the survey

Fig. 1 Respondents' opinion regarding the types of land degradation

There was a question asked about the necessity to subdivide each of the types or their criteria. The following criteria were offered for evaluation of the quality of land comprising an abandoned building: visual pollution, the quality of engineering communications, environmental condition, the level of buildings' deterioration etc. Figure 2 ranges the positive answers to the

above mentioned question: visual pollution with a positive answer from 72 respondents or 94 % ranges first, which is followed by the environmental condition (70 respondents or 91 %), the level of buildings' deterioration (63 respondents or 82 %) and soil pollution (59 respondents or 77 %).



Source: the authors' calculations based on results of the survey

Fig. 2 Respondents' opinion regarding the evaluation criteria of abandoned building site

As regards such a type of land degradation as abandoned mining site, the respondents were asked to provide the time period of mines not being used (in years) from which mines could be considered as abandoned or degraded. The offered variants included (1 year; 3 years; 5 years; no answer). The positive answers could be ranged as follows: the positive answers for 5 years from 49 respondents or 64 % range first, followed by 3 years (24 respondents or 31 %), and no answer for 1 year. The next question was asked to find out if a type of an abandoned mining site should be subdivided. Respondents gave 41 or 53 % positive answers and 33 or 43 % negative answers, but 4 (5 %) respondents did not have an opinion. The respondents did not have any suggestions for subdivisions of such territories.

Similar results were obtained regarding subdivisions of types of land degradation from abandoned military activity and economic activity. Concerning the point of an abandoned site of military activity, the respondents gave 42 or 52 % positive answers and 34 or 44 % negative answers, but 3 (4 %) respondents did not have an opinion. The respondents mentioned different criteria for defining abandoned site of military activities: existence of explosive objects, existence of toxic and dangerous substances (70 or 91 % positive answers), a production unit or a building meant for military purposes (70 or 91 % positive answers) and an abandoned residential area built for military purposes (62 or 80 %).

The next question was asked to provide the time period in years from which a site for economic activities could be considered as abandoned. The offered variants included 1 year; 3 years; 5 years; no answer. The positive answers could be ranged as follows: the positive answers for 5 years from 37 respondents or 48 % range first, followed by 3 years (36 respondents or 47 %), only one respondent chose 1 year and 3 respondents did not have an opinion.

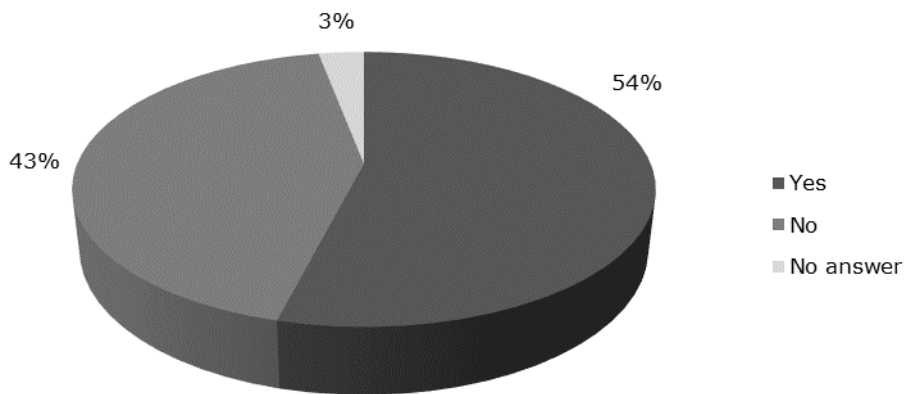
Concerning the necessity to subdivide the type of an abandoned site for economic activity, 39 or 51 % respondents gave positive answers and 34 or 44 % respondents gave negative answers, but 4 (5 %) respondents did not have an opinion. The respondents did not have any suggestions for subdivisions of such territories.

The next question of the survey focused on the information sources of degraded territories. The respondents had to choose from two variants: the information could be obtained from public information systems or by examining the site on the spot. The majority of respondents (65 respondents or 84 %) hold the view that the information on degraded territories should be obtained from real-life inspection, but 51 respondents or 66 % think that the information should be obtained from public information systems. The next question was meant to find out if respondents knew any other ways how to detect such degraded land. Mostly, answers combined the two already offered variants in one. However, some respondents thought that only real-life inspection is appropriate, some suggested that such information is available in the local governments in relation to spatial planning.

There was a question if the data on degraded territories should be stored in one separate information system. 42 respondents (54 %) gave a positive answer, 33 respondents (43 %) gave a negative answer, but two respondents (3 %) did not know the answer (Figure 3).

It was important to find out the respondents' opinion regarding a person or institution responsible for submitting an application for receiving of the status of degraded territory. Respondents had to choose from four variants (an applicant is an owner of the real estate, an employee of the local government, it is a public institution, any of these three). The analysis of the results show that the majority of respondents (78 %) considered an employee of the local

government as the most suitable candidate (Table 1).



Source: the authors' calculations based on results of the survey

Fig. 3. Respondents' opinion regarding the storage of data on degraded territories in a separate information system

However, almost the same amount of respondents (72 %) considered that any of the above mentioned applicants could suggest that a site could receive the status of a degraded territory. Nearly a half of respondents (38 or 49 %) mentioned a public institution as the most suitable applicant. The respondents suggested the following institutions: the State Environment Service (20 answers or 47 % out of those 38 respondents who suggested a public institution), the State Land Service (7 answers or 16 %), and two positive answers were given for each of these institutions: the State Environmental Office, State Environmental Service in Cooperation with Local Government, Rural Support Service and the Ministry of Environmental Protection and Regional Development.

The authors agree that employees of local governments are the most suitable applicants since local governments will be responsible for identifying and fixation of boundaries of the degraded territories. Therefore, another question of the survey was asked to find out which specialist of a local government should be responsible for submission of an application. The respondents had to choose from two variants: a specialist of real estate issues or a specialist responsible for the territorial planning in a local government. The analysis of the results shows

that 55 respondents (71 %) considered that a specialist responsible for the territorial planning, but 29 respondents or 38 % considered that a specialist of a local government in real estate issues should perform the identification of degraded territories.

Table 1

Respondents' opinion regarding an applicant for receiving the status of degraded territory

Applicant for receiving the status of degraded territory	Number of positive answers	Share of positive answers	Total number of respondents
An owner of real estate	43	56 %	77 or 100 %
An employee of a local government	60	78 %	
A public institution	38	49 %	
Any of them	55	72 %	

Source: the authors' calculations based on results of the survey

This question is related to the question which is meant to find out if it is necessary to update the information on degraded territories and to design respective thematic planning. The analysis of the answers show that the majority (50 respondents or 65 %) agreed, but 23 respondents (30 %) did not consider it

necessary to update the information, 4 respondents (5 %) did not give any answers.

### Conclusions, proposals, recommendations

- 1) Land degradation problem has become an important worldwide problem at all levels. As regards Latvia, the Law on Land Management (in force from 1 January 2015) was issued to draw an attention to land degradation risks and their prevention; however, the classification of land degradation has not been worked out, there is no regulation regarding identification of land degradation and its evaluation procedure.
- 2) Foreign and Latvian researchers have studied land degradation problems and its impact on sustainable development; however, the studies are mostly related to soil degradation, its influence and prevention. Land degradation processes affect not only agricultural land, but also rural and urban areas.

- 3) The most common degraded territories in Latvia cover industrial and agricultural production sites, their infrastructure, abandoned military bases, their surrounding areas and abandoned unfinished buildings from the Soviet period.
- 4) The results of the survey among the senior staff of local governments and public institutions show that respondents agree with the classification of degraded land suggested in the Law on Land Management, i.e., degraded land refers to abandoned building sites, abandoned mining sites, abandoned sites of economic activity, abandoned sites of military activity. The more detailed subdivision could be created after identification of degraded territories of a respective type.

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