

Sustainable Development Strategy of Multilevel Spatial System

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Abstract. The main research problem is analysis of the possibility to receive relevant information from upper levels (world, national) for analysing and modelling the subsystems of Kurzeme region. All regional development strategies are usually developed in a descriptive format within the framework of one version, ignoring the uncertainty factor in the future. It is not enough to clarify the decisive impact of the sustainability on the quality of life and overall development strategies at various levels. The new development strategy and spatial planning of regions and districts must be elaborated on the basis of sustainability and systems thinking, using dynamic modelling.

Keywords: sustainable development, systems thinking, modelling, spatial planning, quality of life

INTRODUCTION

Development Planning System Act [1] states that the development planning documents must follow the long-term concept of Latvian growth model: People First. In this document the quality of life is the goal of development.

Traditional planning concept provides the optimal result, which is based on prediction, analysis of opportunities and key decisions on the future of the region [3]. This concept includes a passive adaptation to the environment, which is believed to be outside our control. By contrast, we offer an innovation concept and the systems design, which includes an active environmental control system and decision-making system that can learn and adapt more effectively than the optimized system. We now need to move beyond the reductionist thinking to expansionism (training, developed by systems thinking) to promote the ability to develop a system, whose main attribute is uncertainty. In contrast to reductionism, expansionism states that any complete understanding of the phenomenon is an ideal that can never be achieved, but which we are trying to achieve. This concept implies moving from larger to smaller systems, in contrast to analytical approach, which implies moving from smaller to larger systems.

STRATEGIC PLANNING

In traditional strategic planning process, much attention is paid to analysing current situation (political, economic, social and technological), industry, competitors and society. Various methods can be used for this analysis, however, the problem is that this analysis is not related to the specifics of strategic choices and therefore time is wasted uselessly. Many of the conducted analyses actually do not affect the strategy. The best approach to planning is, first, to identify the key strategic choices and, subsequently, to analyse these choices (see Fig.

1). In this way the planning process becomes much more manageable and focused on performance [4].

System thinking is a process by which the activities of the continuous learning and feedback help to develop a more organized understanding and ability to see things and processes holistically. Richard Bawden [5] for a long time has worked in many parts of the world on encouraging senior management to use systems thinking. He observed the need for two major transitions. The first transition is the way from reductionism (dividing the problem into smaller units) in the direction of the holistic thinking (abstract and see the system in perspective, as a whole).

The second transition is the way from shift from positivism (everything has an explanation and everything must be understood) to pluralism (the opposite of the use of one interpretation or technique). [5].

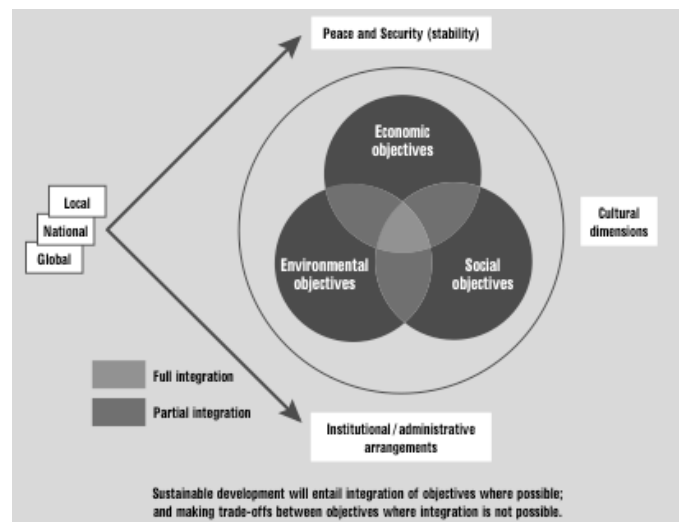


Fig. 1. Dimensions of sustainable development [13]

OBJECTIVE AND STRATEGY

We will agree on the idea that the quality of life is the key objective of the human development in any place. The overall aim of the renewed EU Sustainable Development Strategy is to identify and develop actions to enable the EU to achieve continuous improvement of the quality of life both for current and for future generations, through the creation of sustainable communities able to manage and use resources efficiently and to tap the ecological and social innovation potential of the economy, ensuring prosperity, environmental protection and social cohesion [7].

Latvian National Development Plan (LDP) [8] has defined life quality as a long-term goal for the future (vision). It

should be noted that in the strategic documents at all levels the quality of life is not consistently supported by specific objectives and priorities that are specified in the indicators. They are not designed for evaluating indicators system the quality of life on the different levels (global, regional, national, local). All development strategies (other than the Forester and Meadows [9] global development dynamic model) are developed usually in the descriptive format within the framework of one version, ignoring the uncertainty factor. It is not enough to clarify the principle of the impact of sustainability on the quality of life and overall development strategies at various levels. Any change affects the development of the strategy towards the set of goals and often requires an updating, clarification, expansion and change of the strategy not only at local, but also at regional and national levels. The traditional approach does not ensure promotion of cooperation and consolidation among all activities of the public sector in development of the strategy for achieving that aim. Individual sectors also put forward their own, independent views, which often come in conflict, especially when it concerns the sustainability of the development situations. The developed strategy is unable to react to extreme situations like the current crisis in Latvia and the world. Results of academic research in the form the recommendations for policy marker are either incomprehensible to the public or, if understandable, are dealt with suspicion as being unreliable, or at best, are seen as an interesting hypothesis that is "worthy of further investigation". The recommendations do not support behaviour change at grassroots level, and that gives the politicians the freedom to support the current trend without any changes [10]. There is certain lack of regional and local (cities, districts, municipalities) development strategies, the existing ones are not adequately used in decision-making and are largely out of date lying on the shelves. A new regional development strategy cannot be incorporated into development strategies of constituent parishes. Rather, a number of new insignificant structural and functional changes are introduced.

CASE OF KURZEME REGION

Kurzeme region (Fig. 2) is a typical example of the regional economic fragmentation. Economic activity is concentrated in both the capital and major cities from which Ventspils is the lead. The region also has three medium-sized cities and districts, two of which (Talsi and Saldus) have better transport connections with Riga and so are much more dynamic than the third - Kuldiga. The remaining two areas (in Liepāja and Ventspils districts) are clearly lagging behind and seem relatively isolated from the rest [11]

Agriculture statistics shows that in Kurzeme there are 26,900 farms, of which 1.5% are situated in the region's rural area. 95% of all households are private. 21.6% of all households in terms of size are no larger than 3ha and 88% of them are subsistence farmers. 78.4% of farms are larger than 3ha and 63% of them are subsistence farmers. Only 15.4% of the region's farms sell half of their output, but the combination

of all farms together constitutes 43% of the region's arable land. 135 thousand inhabitants live in Kurzeme region, which is 13% of total population. Most people in the region are located in two major cities - in Liepāja and Ventspils. The resources necessary for the development of economy are mainly concentrated in two major cities. Other parts of the region are developing quite unevenly, in many parishes GDP per capita is low and the population drain is a pressing concern. The region, as other regions in the country, is now generally suffering from the drain of skilled labour.



Fig. 2. Plan of Kurzeme region [14].

Current situation in spatial planning is characterized as follows: when a new county is established, the local government reform calls for the development of new regional development plans integrating urban and rural areas. County and regional spatial development plans aligned with the Latvian National Development Plan and the European Union's strategic directives on spatial planning call for a critical evaluation and development of advanced methodologies. Spatial planning process does not involve a systemic approach and modelling, as well as planning objectives with relevant evaluation methods and indicators. This significantly reduces the quality of decision-making for the spatial development and, consequently, lowers the quality of life. Planning documents for sustainable development are of declarative nature and their principles are not used for spatial planning of concrete solutions. Spatial development forecasts have no planning perspective effects, no analysis and evaluation in

accordance with principles of sustainable development is carried out. Decision-making process in different regions at Latvian municipal levels is based on subjective proposals for spatial planning, leading to adverse effects on long-term development thus lowering the quality of human life. European scientific and practical experience has shown the increase in using of computer modelling programs for strategic and regional spatial planning. The main problem is the inadequacy of the current spatial planning to European standards and principles of sustainable development, as well as failure to provide comprehensive and effective public participation in decision-making processes. Regional development simulation will enable decision makers and the public better understand the nature of the planning process, discuss and choose the scenarios, use concrete and clear criteria and detailed indicators. Simulation model will provide an opportunity to consider short-term and long-term consequences of the decision-making procedure as well as to evaluate various development options. Simulation model allows discussing any new problems, their solutions, and facilitating efficient decision making. Sustainable communities are defined as "places where people want to live and work both now and in the future". They meet diverse needs of the current and future population in caring for the environment and promoting a high standard of living. They are safe and inclusive, well designed, built and maintained, as well as offer equal opportunities and good services [12]. ESPON (European Spatial Planning Observation Network) plays an important role. It is a research program that analyses the desire for territorial cohesion and balanced development priorities across the EU. ESPON Programme covers policy areas such as economic, social and governance policies, the role of cities and urban centres in environmental sustainable development. The current trends of expanding the functional urban areas provide greater employment opportunities, but, despite this positive impact on competitiveness, this is a negative trend with regard to sustainability, mainly because of the increase in work-related travel and private car use in urban areas. So reducing the number of cars and public transport promotion in sustainable communities is a critical strategy question.

COMPARISON OF STRATEGIES

The global spatial system has a hierarchical structure with various levels of many subsystems:

- European Union, America, Asia, Australia, etc.
- National states - Latvia, etc.
- Regions - Kurzeme, Zemgale, etc.
- Counties - Kuldiga, etc.
- Communities - parishes, villages, towns, districts

Each level is designed and implemented in the context of the spatial development program, which has its own objectives, guidance, criteria, indices and indicators.

Experience shows that it is possible to analyse and model the individual subsystems that have the following provisions:

- Definition to designate principal subsystems is obtained from the upper levels;

- Maintenance of the target function is determined on the upper levels of the system;

- Utilized criteria, benchmarks and indicators are adopted for the upper levels of the global, national and regional systems.

The main research problem is the following: Is it possible to receive relevant information from the upper levels for analysis and modelling of the subsystems of Kurzeme region?

In Gothenburg 2006 all EU Member States (including Latvia) approved the European Sustainable Development Strategy (EU SDS) [13]. On this basis the SDS are developed by the EU Member States, while maintaining the objectives.

The overall aim of the EU Sustainable Development Strategy is to identify and develop actions to enable the EU to achieve a continuous long-term improvement of the quality of life through the creation of sustainable communities able to manage and use resources efficiently, able to tap the ecological and social innovation potential of the economy and in the end able to ensure prosperity, environmental protection and social cohesion.

Sustainability and cohesion are the main EU spatial development criteria (indices) to be followed at all levels of the system below it.

The strategy sets overall objectives and concrete actions for seven key priority challenges:

- Climate change and clean energy;
- Sustainable transport;
- Sustainable consumption & production;
- Conservation and management of natural resources;
- Public Health;
- Social inclusion, demography and migration;
- Global poverty and sustainable development challenges.

The SDS of Latvia is a comprehensive long-term national policy document defining development priorities and spatial development perspective. It defines tasks for government and society to achieve sustainable development goals by outlining the ways to respond to global changes successfully through shaping the upcoming challenges into new opportunities.

Latvian SDS differs significantly from the EU SDS objectives and guidelines. Improving the quality of life by creating sustainable communities is not mentioned in the LSDS text, which shows that LSDS does not follow EU SDS guidelines and directions.

Large differences are observed also from SDS of other EU members (Estonia, Finland, Great Britain, Austria), which develop their strategies in accordance with the EU SDS principles, guidelines and indicators of the EU SDS.

For example, United Kingdom SD strategy sets out clearly that sustainable development means "a better quality of life for everyone, now and for generations to come".

Key indicators of sustainable consumption and production include those which show the extent of 'decoupling' – how successful we are in breaking the link between economic growth and environmental damage.

Making the vision of sustainable communities a reality at the local level means sending the right signals to local governments about the importance of sustainable

development, supporting strong local leadership and developing the right skills and knowledge.

Sustainable communities embody the principles of sustainable development:

- Balance and integrate the social, economic and environmental components of their community;
- Meet the needs of existing and future generations;
- Respect the needs of other communities in the wider region or internationally also to make their communities sustainable.

NATIONAL DEVELOPMENT PLAN OF LATVIA (NDP)

NDP is the highest medium-term strategic planning document in the policy planning system of the country approved by the Government. For the period of 2007-2013, it is a compass for politicians, public servants and all citizens of Latvia, it determines Latvia's main development directions and shows the most important national aims on the way to the higher objective – a gradual increase in the quality of life. This objective may be attained only by a strong, unified and confident society (Fig. 3).

The NDP for Latvia:

- Proposes medium-term goals and priorities;
- Facilitates formation of a common understanding and involvement of the entire society;
- Focuses attention and financial resources for ensuring the country's and society's sustainable development;
- Sets forth guidelines for drafting planning documents at all levels and sectors.

The objective of the plan is to facilitate a balanced and sustainable development of the country, as well as to ensure an increase in Latvia's competitiveness. It is a contribution to the common strategy of the EU member states and to the implementation of the Lisbon program.

The objective is a long-term choice, as the process of the NDP requires achieving a breaking point in education, science and industry in order to develop a stable intellectual and material basis for a gradual increase in the quality of life (fig.3).

The plan underlines several turning points:

- Turning point in the attitude, as it seeks to find answers to questions that are important for all the people of Latvia:
 - What should Latvia be like?
 - How to ensure national competitiveness?
 - What should the people - the developers of Latvia's future - be like?
- Turning point in planning, as it is based on long-term objective and sets a medium-term strategy to reach the objective,
- Turning point in public participation, as it enhances the creation of uniform perception and involvement of the entire society.

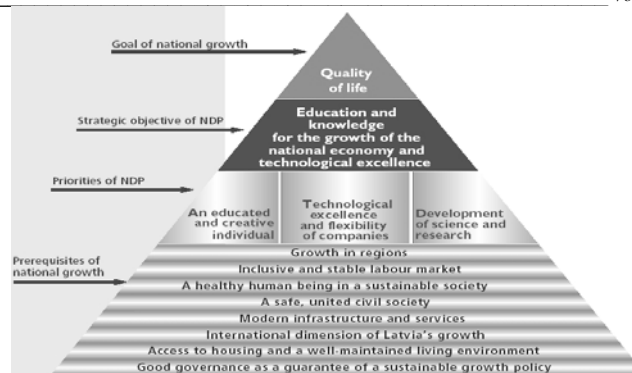


Fig. 3. Goals and objectives of NAP [8].

NDP AND KURZEME REGION

The following table attached (Fig. 4) shows the NDP and Development Strategy of Kurzeme region (DSKR) corresponding objectives, measures, priorities and targets comparison. The first conclusion to be drawn from this comparison is that the failure to provide consistency with the NAP, as required by law is apparent from the comparative analysis; there are no direct, literal coherence DSKR policies and procedures in the wording of the NDP priorities and prerequisites. It is difficult to compare differences in methodology and terminology of NAP and DSKR descriptions. It seems logical, if the NDP and DSKR are developed within the same methodology, so DSKR should be NDP detail at a regional level as on systems approach based development planning, system of indicators, monitoring and evaluation to promote effective governance processes throughout the Latvian territory. NAP and DSKR comparative analysis shows that only a small part of the NAP priorities and preconditions are sustained and maintained in DSKR targets and measures. These would be mainly related to education, sustaining competitive provision, promoting entrepreneurship and enhancing wellbeing.

REGIONAL POLICY FRAMEWORKS (2004 -2014)

Regional policy framework [15] is determined by the national regional policy and is developed according to the Law on Regional Development. The aim is to ensure the increase in development level in the regions establishing territorial cohesion and competitiveness.

Main objectives are:

- To ensure the development and implementation of regional development planning documents.
- To elaborate and implement the mutually coordinated policy of different sectors.
- When developing the policy of individual sectors the characteristics of the country and its regions shall be considered and the potential impacts on them assessed.
- To coordinate the use of support instruments for achieving the aims set in the regional development planning documents.
- To implement the administrative territorial reforms.
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- To ensure the distribution of state support programs and EU structural fund finances between the planning regions according to the priorities defined in the development programs.
- To set the territorial differentiation for the state support instruments and increase the available set of support instruments for local territorial development.
- To develop the cooperation mechanism for the regional development and provide support to the regional and local institutions to increase their administrative capacity.
- To create the preconditions to increase the international significance and competitiveness of the capital city Riga.

MODELLING OF REGIONS AND COUNTIES

All Latvian regions have the development strategies that are not based on the principles of sustainability. Regional development plans are not intended for creation of sustainable communities. Planning documents at regional level are out of date and lost its significance due the new district creation and the economic crisis.

New development strategy and spatial planning of regions and districts must be elaborated on the basis of sustainability and systemic thinking, using systems dynamic modelling.

Objectives of policies, criteria and indicators for the upper levels are moving to the lower levels (Fig.5). Regional and district level decision-making in sustainable spatial development is based on a dynamic scenario comparison and analysis.

The scenario adopted at local level with the assistance of GIS is specified in the planning documentation. Continuous monitoring at any moment gives opportunity to assess the situation and to make changes.

CONCLUSIONS

Traditional strategic planning process pays much attention to analysing the current situation, industry, competitors and society. Many of the developed analyses actually do not affect the strategy.

Systemic thinking is a process by which the activities of continuous learning and feedback help replace certain goals or end results.

We will agree on the notion that the quality of life is a key objective of human development in any place.

It should be noted that in the strategic documents of all levels, the quality of life is not consistently supported by specific objectives and priorities specified in the indicators.

The developed strategies are unable to react to extreme situations like the current crisis in Latvia and in the world.

Kurzeme region is a typical example of the regional economic fragmentation. Region, as other regions in the country, is now generally suffering from the drain of skilled labour.

The comparative analysis shows that there is no direct coherence between strategy policies for Kurzeme region and the same procedures in the wording of the priorities and prerequisites of the National Development Plan.

Sustainable development planning documents are of declarative nature and their principles are not used for spatial planning of concrete solutions. Spatial development forecasts do not provide analysis and evaluation of planning perspective effects and are based on subjective proposals for spatial planning, leading to adverse effects of long-term development thus lowering the quality of human life. Regional development simulation will enable decision makers and the public to better understand the nature of the planning process, discuss and choose the scenarios, use concrete and clear criteria and detailed indicators.

Sustainable communities embody the principles of sustainable development.

Systems dynamic modelling ensures sustainable development of a county or region to enhance the quality of life for the entire population and society as a whole.

REFERENCES

- [1] Attīstības plnošāanas sistēmas likums. www.likumi.lv/doc.php?id=175748 Resource retrieved on April 26, 2011.
- [2] Sustainable communities: building for the future. www.communities.gov.uk/documents/communities/pdf/146289.pdf Resource retrieved on April 26, 2011.
- [3] Terrance M. Brueck. Strategic planning in today's dynamic world Water Supply Vol 5 No 2 pp 53-62 © IWA Publishing 2005 <http://www.iwaponline.com/ws/00502/> Resource retrieved on April 26, 2011.
- [4] Hjorth P., Bagheri A. Navigating towards sustainable development: A system dynamics approach. Futures, 38(1):74-92, February 2006.
- [5] G.N.Mankiw, D.Romer, D.N.Weil. A contribution to the empirics of economic growth, The Quarterly Journal of Economics, 107(2): 407-437, 1992.
- [6] Benkovskis K., Stikuts D. Latvijas makroekonomiskais modelis, 2006.
- [7] BRUSSELS EUROPEAN COUNCIL 14 DECEMBER 2007 PRESIDENCY CONCLUSIONS. Point 56. www.consilium.europa.eu/ueDocs/cms_Data/docs/.../97669.pdf Resource retrieved on April 26, 2011.
- [8] Latvijas nacionālais attīstības plāns (NAP) www.rapl.gov.lv/pub/print.php?id=94 Resource retrieved on April 26, 2011.
- [9] Forrester J. World Dynamics. Wright-Allen Press, 1971.
- [10] G.Dāvidsons and A.Meļihovs. Ražošanas progresa un cilvēkkapitāla nozīme Latvijas izaugsmes tautsaimniecības nodrošināšanā, 2006.
- [11] Institucionālās kapacitātes stiprināšana Kurzemes reģionā. Kurzemes reģiona Rīcības plāns 2007. – 2013. gadam „KURZEME 2013. gadā” www.liepaja.lv/upload/Bizness/.../kurzemes_planoshanas_riicibas_doc2.pdf Resource retrieved on April 26, 2011.
- [12] The UK Government Sustainable Development Strategy <http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/> Resource retrieved on April 26, 2011.
- [13] The DAC Guidelines. Strategies for Sustainable Development: Guidance for Development Co-operation. www.oecd.org/dataoecd/34/10/2669958.pdf Resource retrieved on April 26, 2011.
- [14] Kurzemes plānošanas reģiona telpiskais (teritorijas) plānojums. II daļa. Telpiskās attīstības perspektīva 2006 - 2026. Latvijas Universitāte, 2007. www.kurzemesregions.lv/media/.../telpiskas_attistibas_perspektiva_ii.doc Resource retrieved on April 26, 2011.

[15] Reģionālās attīstības likums
.http://www.nap.lv/lat/attistibas_planosana/normativie_akti/?doc=175
Resource retrieved on April 26, 2011

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Jēkabs Trušīņš. Daudzlīmeņu telpiskās sistēmas ilgtspējīgās attīstības stratēģija

Raksta mērķis ir informēt lasītāju par problēmām, kas tiek pētītas zinātniskā projekta ietvaros, izstrādājot Kuldīgas novada ilgtspējīgas attīstības sistēmdinamisko modeli. Balstoties uz sistēmpieejas principiem, Kurzemes reģionu var uzskatīt par Latvijas telpiskās sistēmas apakšsistēmu, kas savukārt ir Eiropas Savienības apakšsistēma. Katrā no šīs sistēmas līmeņiem tiek izstrādātas stratēģijas un dažādas attīstības programmas, kā arī atsevišķas ilgtspējīgas attīstības stratēģijas. Ja Eiropas Savienību uzskatām par vienotu sistēmu ar kopīgiem mērķiem, tad ilgtspējīgas attīstības vadlīniju dekompozīcijai jābūt saskņotai visu līmeņu apakšsistēmās, sākot no Eiropas līmeņa līdz reģiona un novadu līmenim.

Galvenā pētniecības problēma ir sekojoša: vai ir iespējams saņemt atbilstošu informāciju no sistēmas augstākajiem līmeņiem Kurzemes reģiona apakšsistēmu analīzei un modelēšanai? Visas attīstības stratēģijas ir izstrādātas aprakstošā formā vienā versijā, ignorējot nenoteiktības faktoru. Nav pietiekami izskaidrota ilgtspējības principu ietekme uz dzīves kvalitāti un attīstības stratēģiju dažādos līmeņos. Ilgtspējība un kohēzija ir galvenie telpiskās attīstības kritēriji, kam jādarbojas visos sistēmas zemākajos līmeņos. Jāapgūst sistēmiskā domāšana un jāatsakās no tradicionālā redukcionalisma, kad sistēma vai problēma tiek sadalīta atsevišķās sastāvdaļās, kuras tiek analizētas, pētītas un risinātas patstāvīgi, bez saistes ar citiem strukturāliem elementiem. Ir jāizstrādā jauna reģionu un novadu attīstības stratēģija un telpiskie plānojumi, pamatojoties uz ilgtspējības principiem, sistēmisko domāšanu un sistēmanalīzi, pielietojot sistēmdinamisko modelēšanu. Reģionālās attīstības modelēšana veicinās lēmumu pieņemējiem un sabiedrībai labāk saprast plānošanas procesu, apspriest un izvēlēties attīstības scenārijus, izmantot skaidrus kritērijus un detalizētus indikatorus.

Екабе Трушиньш. Стратегия устойчивого развития многоуровневой пространственной системы

Цель публикации – информировать читателя о проблемах, которые изучаются в составе научно-исследовательского проекта, разрабатывая системно-динамическую модель устойчивого развития Куддигского округа Курземского региона. Опираясь на принципы системного подхода, Курземский регион можно рассматривать как подсистему Латвийской пространственной системы, которая, в свою очередь, является подсистемой Европейского союза. На каждом уровне этой системы разрабатываются стратегии и разные программы развития, а также отдельные стратегии устойчивого развития. Если мы рассматриваем Европейский союз как единую систему с общими целями, тогда декомпозиция ведущих установок должна быть согласована в подсистемах всех уровней, начиная с европейского уровня до уровней региона и округа.

Главная цель исследования – возможность получения соответствующей информации от верхних уровней системы для анализа и моделирования подсистемы Курземского региона. Все стратегии развития разработаны в описательном формате в одной версии, игнорируя фактор неопределенности. Недостаточно раскрыто влияние принципов устойчивости на качество жизни и стратегию развития на разных уровнях системы. Устойчивость и кохезия являются главными критериями пространственного развития, которые должны действовать также на всех нижних уровнях системы. Следует освоить системное мышление и отказаться от традиционного редуccionизма, когда система или проблема делится на составные части, которые анализируются, изучаются и решаются самостоятельно, без увязки с другими структурными элементами. Следует разработать новую стратегию развития и пространственную планировку для регионов и округов на основе устойчивости и системного мышления, используя системно-динамическое моделирование. Моделирование регионального развития дает возможность лицам, принимающим решения, и обществу лучше понимать процесс планирования, обсуждать и выбирать сценарии развития, используя ясные критерии и детальные индикаторы.