

Daugavpils University

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**DATA-BASED MACHINE DIAGNOSTICS  
OF LOCAL TERRITORIAL DEVELOPMENT:  
THE CASE OF LATVIAN MUNICIPALITIES**

Daugavpils  
2025

Apstiprināts Daugavpils Universitātes Zinātnes padomes sēdē 2025.gada 7. aprīlī, protokols Nr. 18.

Komarova V., Ruža O., Kudiņš J., Čižo E., Kokarēviča A. Data-Based Machine Diagnostics of Local Territorial Development: The Case of Latvian Municipalities. Daugavpils: Daugavpils Universitātes Akadēmiskais apgāds "Saule", 2025, 182 lpp.

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ISBN 978-9934-39-037-1

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## ABSTRACT

The study “Data-Based Machine Diagnostics of Local Territorial Development: The Case of Latvian Municipalities” worked out by Vera Komarova, Oksana Ruža, Jānis Kudiņaš Edmunds Čižo, Anita Kokarēviča (Latvia) and supervised by the University’s of Pisa Professor Antonio Frangioni (Italy) and Augšdaugavas County Municipality’s Executive Director Pēteris Dzalbe (Latvia), is aimed at analyzing the capabilities of statistical software (IBM SPSS) and AI tool (ChatGPT 4o) for data-based machine diagnostics of local territorial development using the case of Latvian municipalities. The authors propose the following research hypothesis: statistical software (IBM SPSS) and AI tool (ChatGPT 4o) are capable and very efficient in data-based machine diagnostics of local, territorial development, and contextual data is a necessary input for such diagnostics. It seems that contextual tacit knowledge (“data in the air”) is a required input to any analysis along with measurable explicit data (“data in databases”), and the former is beyond the purview of both data science and computer science, but accessible only to experts who are really involved in the context of the issue being analyzed. The information base of this study consists of Latvian municipalities’ statistical data (2022–2023), their annual public reports (2023), as well as own collected data of sociological survey of administrative staff responsible for the creation of annual public reports in Latvian municipalities or actively involved in this process (n = 43, May–June 2024). The methodological approaches and data analysis methods applied in the study: discourse analysis, to place the diagnosed territories in the broader context of their sustainable development; correlation analysis, to quantify the relationships between the main potential determinants of the typology of Latvian municipalities; cluster analysis, to identify empirical types of Latvian territories within the methodological approach of discourse analysis; SWOT-analysis, to understand the strengths, weaknesses, opportunities and threats associated with each specific municipality in the context of typological clusters of Latvian municipalities; evaluation of maturity levels of business process modeling for data-based machine diagnostics of local territorial development in Latvian municipalities. The main result related to the research hypothesis is as follows: contextual data on Latvian municipalities, including tacit knowledge typically accessible only to local experts, can be effectively analyzed using statistical software and AI tools. This finding challenges the initial hypothesis, highlighting the potential of combining explicit and tacit data in data-based machine diagnostics of local territorial development.

**Keywords:** data-based machine diagnostics, local territorial development, territorial analytic data (TAD), contextual data, data system, statistical software, AI tools, business process modeling (BPMdl), business process management (BPMng), Latvian municipalities.

## KOPSAVILKUMS

Veras Komarovas, Oksanas Ružas, Jāņa Kudiņa, Edmunda Čižo, Anitas Kokarēvičas (Latvija) pētījums “Datos balstīta vietējās teritoriālās attīstības mašindiagnostika: Latvijas pašvaldību piemērs” (izstrādāts Pizas Universitātes profesora Antonio Frandžioni (Itālija) zinātniskajā vadībā un Augšdaugavas novada pašvaldības izpilddirektora Pētera Dzalbe (Latvija) praktiskajā vadībā) ir vērsts uz statistiskās programmatūras (IBM SPSS) un AI rīka (ChatGPT 4o) spēju analīzi datos balstītai vietējās teritoriālās attīstības mašindiagnostikai, par piemēru izmantojot Latvijas pašvaldības. Autori izvirza pētījuma hipotēzi: statistikas programmatūra (IBM SPSS) un AI rīks (ChatGPT 4o) ir spējīgi un ļoti produktīvi datos balstītā vietējās teritoriālās attīstības mašindiagnostikā, un kontekstuālie dati ir nepieciešams ievads šādai diagnostikai. Izskatās, ka kontekstuālās implicētas zināšanas (“dati gaisā”) ir obligāts ievads jebkurā analīzē kopā ar izmērāmiem precīziem datiem (“datiem datubāzēs”), un pirmais ir ārpus datu zinātnes un datorzinātnes kompetences, bet ir pieejams tikai ekspertiem, kuri ir reāli iesaistīti analizējamā jautājuma kontekstā. Pētījuma informatīvo bāzi veido Latvijas pašvaldību statistikas dati (2022.g.–2023.g.), to gada publiskie pārskati (2023.g.), kā arī pašu savāktie par ikgadējo publisko pārskatu veidošanu atbildīgo vai šajā procesā aktīvi iesaistīto administratīvo darbinieku socioloģiskās aptaujas dati (n = 43, 2024.g. maijs–jūnijs) Latvijas pašvaldībās. Pētījumā izmantotās metodoloģiskās pieejas un datu analīzes metodes: diskursanalīze, lai diagnosticētās teritorijas iekļautu plašākā to ilgtspējīgas attīstības kontekstā; korelācijas analīze, lai kvantitatīvi noteiktu sakarības starp galvenajiem potenciālajiem Latvijas teritoriju tipoloģiju noteicošajiem faktoriem; klasteranalīze, lai diskursanalīzes metodoloģiskās pieejas ietvaros identificētu Latvijas teritoriju empīriskos tipus; SVID analīze, lai izprastu katras konkrētās pašvaldības stiprās un vājās puses, iespējas un draudus Latvijas pašvaldību tipoloģisko klasteru kontekstā; biznesa procesu modelēšanas brieduma līmeņu izvērtēšana datos balstītai vietējās teritoriālās attīstības mašindiagnostikai Latvijas pašvaldībās. Galvenais ar pētījuma hipotēzi saistītais rezultāts ir sekojošs: kontekstuālos datus par Latvijas pašvaldībām, tostarp tikai vietējiem ekspertiem pieejamās implicētas zināšanas, var efektīvi analizēt, izmantojot statistikas programmatūru un MI rīkus. Šis konstatējums apstrīd sākotnēji izvirzīto pētījuma hipotēzi, uzsverot izmērāmo un implicēto datu apvienošanas potenciālu datos balstītai vietējās teritoriālās attīstības mašindiagnostikai.

**Atslēgvārdi:** datos balstīta mašindiagnostika, vietējā teritoriālā attīstība, teritoriālie analītiskie dati (TAD), kontekstuālie dati, datu sistēma, statistikas programmatūra, MI rīki, biznesa procesu modelēšana (BPM), biznesa procesu vadība (BPV), Latvijas pašvaldības.



## INTRODUCTION

**Justification of the research topic.** Data-based machine diagnostics of the local territorial development is a new approach to the monitoring, planning and other processes of managing the development of territories (Simonova & Sykora, 2011a, 2011b; Arnould et al., 2020; Nadtochiy et al., 2022; Sen et al., 2023). This new approach is vital to the success of policy development and the delivery of programmes, projects and operational services (Cervera, 2021), as well as to control the balance between economic development, social development, and environmental development (Grybaite & Tvaronavičienė, 2008). The absence of data-based general-scale diagnoses is one of the main reasons why policies, lines of action, and strategies do not adequately respond to the dynamics and needs of territories (Aslaeva, 2020; Suárez-Roldán et al., 2024). In Latvia, the poor state of data-based machine diagnostics of the local territorial development is especially relevant for remote municipalities (Abele et al., 2023; Grytten et al., 2024; Komarova et al., 2024).

**The research problem** concerning data-based diagnostics of local territorial development is centered on the complexity and multifaceted discourse of spatial development issues, encompassing economic, social, environmental, and technological dimensions. For example, Chehabeddine and Tvaronavičienė highlighted the difficulty of creating a comprehensive data-based diagnostic model that incorporates such wide-ranging and evolving factors as indicators and measurement limitations, **interconnected security and development issues**, impact of technological threats (Chehabeddine & Tvaronavičienė, 2020). Can AI tools help with data-based diagnostics of local territorial development? Some studies (Laurini, 2023; Yigitcanlar et al., 2024; Xue et al., 2024; Hu et al., 2024) state that AI tools can significantly enhance local, territorial development data-based diagnostics. **For example**, AI tools can process large datasets to identify patterns and trends in regional development, such as population growth, resource usage, or economic disparities (Laurini, 2023). Machine learning algorithms can forecast future developments, like economic growth or environmental impacts, based on historical data; AI tools can also adapt to local contexts by considering unique regional characteristics, ensuring diagnostics are relevant to specific territories (Xue et al., 2024; Hu et al., 2024). Moreover, AI systems can simulate various development scenarios, helping policymakers understand the potential outcomes of different strategies; decision-support tools can prioritise initiatives based on predicted

effectiveness and alignment with sustainable development goals (Yigitcanlar et al., 2024). By integrating AI tools, local territorial development diagnostics can become more precise, efficient, and adaptable to changing needs, ultimately fostering sustainable and inclusive growth. In Latvia, local territorial development is determined very much by a contextual indicator – the distance of a territory from Riga (the capital of Latvia) not only in the direction of non-EU countries (Russia and Belarus), but also in the direction of EU countries (Estonia). and Lithuania) and the Baltic Sea (Kudiņš et al., 2024).

**The purpose of the study** is to analyse the capabilities of statistical software (IBM SPSS) and AI tool (ChatGPT 4o) for data-based machine diagnostics of local territorial development using the case of Latvian municipalities.

**The research object** is Latvian municipalities (N = 43). The administrative division of Latvia into municipal territories (36 counties and 7 cities of national importance that are not part of the counties) is such from July 1, 2021, in accordance with the Law of the Republic of Latvia “On Administrative Territories and Settlements” (Saeima of Latvia, 2020). All municipalities of Latvia, both counties and cities of national importance, were included in the study sample, which consisted of 43 objects and coincided with the population (in statistical analysis – the entire set of items from which you draw data for a statistical study) of Latvian municipalities. Such a relatively small number of objects can be analysed by statistical methods (Kish, 1965) but requires increased attention to the statistical significance of the results obtained.

Five Latvian municipalities (one from each typological cluster) are selected for the empirical case study: Riga City Municipality (the capital of Latvia, also chosen for the experiment), Yelgava City Municipality (the capital-centered city of Latvia), Liepaya City Municipality (the remote city of Latvia), Ropazhi County Municipality (the capital-centered county of Latvia), Augshdaugava County Municipality (the remote county of Latvia).

The authors propose the following **research hypothesis**: statistical software (IBM SPSS) and AI tool (ChatGPT 4o) are capable and very efficient in data-based machine diagnostics of local, territorial development, and contextual data is a necessary input for such diagnostics. It seems that contextual (narrative) implicit data (‘knowledge in the air’ – Bell & Albu, 1999) is a required input to any analysis along with measurable explicit data

(‘knowledge in databases’ – Matheus et al., 1993), and the former is beyond the purview of both data science and computer science, but accessible only to experts who are actually physically involved in the context of the issue being analyzed.

The **information base** of this study:

- Latvian municipalities’ statistical data (2022–2023) (Central Statistical Bureau (Latvia), 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g; State Treasury of Latvia, 2024);
- Latvian municipalities’ annual public reports (2023) (Latvian: *pašvaldību publiskie pārskati*) submitted to the Ministry of Smart Administration and Regional Development (Latvian: *Viedās administrācijas un reģionālās attīstības ministrija*) (Ministry of Smart Administration and Regional Development (Latvia), 2024);
- own collected data of sociological survey of administrative staff responsible for the creation of annual public reports in Latvian municipalities or actively involved in this process (n = 43, May–June 2024).

**Research methods:**

- discourse analysis, to place the diagnosed territories in the broader context of their sustainable development (including social, economic and environmental aspects);
- correlation analysis, to quantify the relationship between the main potential determinants of the typology of Latvian municipalities;
- cluster analysis, to identify empirical types of Latvian territories within the methodological approach of discourse analysis;
- SWOT-analysis, to understand the strengths, weaknesses, opportunities and threats associated with each specific municipality in the context of typological clusters of Latvian municipalities;
- evaluation of maturity levels of business process modeling for data-based machine diagnostics of local territorial development in Latvian municipalities (using the Business Process Maturity Model (BPMM) with 5-score scale);
- data mining (comparison of means, correlation and regression analysis, and discriminant analysis), to identify statistically significant aspects of business process modeling that influence local economic development.

**Research questions:**

- (1) What are the key strengths and weaknesses of each Latvian municipality?
- (2) What opportunities for development can be identified, and what threats must be mitigated?
- (3) How can data-based machine diagnostics contribute to effective resource allocation for local territorial development?

# **1. THEORETICAL AND METHODOLOGICAL ASPECTS OF DATA-BASED MACHINE DIAGNOSTICS OF LOCAL TERRITORIAL DEVELOPMENT**

## **1.1. State-of-the-art and theoretical basis of the study**

This section overviews the key findings of studies relevant to the analysed issue, contributing to a deeper understanding of the state-of-the-art and perspectives for data-based machine diagnostics of local territorial development.

The study “A new era for data analysis in qualitative research: ChatGPT” (Sen et al., 2023) contributes to the topic of data-based machine diagnostics of local territorial development by exploring the potential of AI tools, specifically ChatGPT-4, in qualitative data analysis. It demonstrates how AI can enhance data organizing, coding, and interpretation, essential for understanding complex phenomena like territorial development (Sen et al., 2023). According to the authors, key contributions include: (1) by automating tasks such as creating codes, categories, and themes, ChatGPT can streamline qualitative analysis, allowing researchers to focus on interpreting and applying insights to local territorial development strategies; (2) the proved ability of ChatGPT to identify relationships and provide explanations for generated codes and themes can help uncover underlying patterns and trends in territorial data; (3) the showed AI tool's adaptability to different languages ensures it can be used in diverse local contexts, which is crucial for territorial development studies that often involve region-specific data; (4) ChatGPT offers a faster alternative to traditional qualitative analysis software, making it accessible to researchers without extensive training in qualitative data analysis tools. By integrating such capabilities, the above study paves the way for leveraging AI tools to support data-driven decision-making in territorial development, addressing both qualitative and quantitative aspects of machine diagnostics in this field (Sen et al., 2023).

Over time, AI tools have become integral to urban and regional planning, moving from simple mapping and information systems to advanced applications like machine learning, rule-based systems, and knowledge management (Laurini, 2023). According to Laurini, AI helps structure and utilise data, enabling decision-making through tools like ontologies, knowledge networks, and rule-based systems; this method solves new problems by

adapting solutions from similar past cases, aiding diagnostic processes and planning decisions; AI models predict trends, optimise resource allocation, and automate processes, such as land-use planning and traffic management (Laurini, 2023). However, there are also real-world challenges, mainly sociological barriers (fear of over-reliance on technology) and technological hurdles (insufficient data representation frameworks). Laurini (2023) emphasises the importance of: (1) holistic data integration to synthesise diverse datasets; (2) dynamic real-time monitoring through IoT-enabled systems; (3) scenario simulations to evaluate developmental impacts; (4) personalised diagnostics tailored to regional characteristics. Hence, Laurini underscores the transformative potential of AI in fostering inclusive and adaptive governance and addressing interconnected economic, social, and environmental challenges in local territorial diagnostics (Laurini, 2023).

Integrating geographic data (GeoAI) and IoT is highlighted as a powerful approach for monitoring and modelling local development trends (Yigitcanlar et al., 2024). Relevant ideas of the study “Artificial intelligence and the local government: A five-decade scientometric analysis on the evolution, state-of-the-art, and emerging trends” (Yigitcanlar et al., 2024) are the following: (1) AI’s ability to predict economic and social trends, optimising resource allocation; (2) customising AI systems for regional contexts to ensure effective diagnostics; (3) using real-time data for responsive and accurate decision-making; (4) identifying sustainable practices to align development with environmental goals. Bertacchini and Bouchet (2016) highlighted the integration of Territorial Intelligence (TI) and Artificial Intelligence (AI) as complementary approaches to understanding and addressing local territorial development. Key findings of the above study (Bertacchini & Bouchet, 2016) relevant to data-based machine diagnostics of local territorial development are the following: (1) TI mobilises resources and fosters collective action, emphasising systemic approaches; (2) “info-obesity” challenges decision-making, and AI mitigates this by processing large datasets; (3) AI-enhanced tools improve visualisation and stakeholder engagement. Relevant ideas for diagnostics include systemic data integration, scenario forecasting, and citizen-centric approaches. Combining TI and AI ensures sustainable, collaborative, and efficient diagnostics, addressing complex regional challenges (Bertacchini & Bouchet, 2016).

Chao and Tao (2023) examined regional integration and AI development in the Yangtze and Pearl River Deltas, offering these relevant insights: (1) holistic resource integration to complement regional advantages; (2) predictive

analytics for growth trends and sustainable planning; (3) real-time monitoring to optimise resource allocation and operational efficiency (Chao & Tao, 2023). The study underscores AI's role in overcoming integration challenges and achieving balanced and sustainable development. In turn, the study "Applications of machine learning in national territory spatial planning" (Xue et al., 2024) highlights machine learning's role in enhancing territorial diagnostics, in particular, big-data-driven monitoring of urban and rural dynamics using remote sensing and IoT, dynamic simulations for urban growth and land-use changes, methodological innovations like spatial modelling and clustering for diagnostics. According to Xue and his colleagues, challenges include the lack of multi-source, high-resolution data. Future directions stress improving small-scale studies, multi-source data mining, and integrating ML in rural innovation (Xue et al., 2024). Overall, the above study emphasises the transformative role of machine learning in making data-based diagnostics more precise, multi-dimensional, and actionable, directly benefiting local territorial development.

The reviewed studies collectively illustrate AI and machine learning's transformative potential in local territorial diagnostics. By integrating big data, GeoAI, and adaptive governance frameworks, AI tools can enhance monitoring, predictive modelling, and resource optimisation. Challenges like data gaps and societal resistance require continued innovation and stakeholder engagement to realise AI's full potential for sustainable territorial development. A remaining gap that the authors hope to fill with further research is the lack of empirical and experimental case studies that demonstrate the real (not just theoretical) feasibility and usefulness of statistical software and AI tools for data-based diagnostics of local territorial development.

## **1.2. "Frame of reference" and key terms of the study**

According to the authors, the issue of data-based machine diagnostics of local territorial development is interdisciplinary in nature. The "frame of reference" of this study refers mainly to the sciences of regional economics, computer science and data science and is based on three key terms / terminological constructions: (1) machine diagnostics of the local territorial development (this terminological construction refers to computer science & regional economics); (2) data, in particular, territorial analytic data, TAD (Simonova & Sykora, 2011a, 2011b) (the term refers to data science). Table 1.1 attempts to systematically present the "frame of reference" and key terms /

terminological constructions of the study, including their conceptual understanding within the study, empirical interpretation and referent science.

Table 1.1

**The “frame of references” and key terms / terminological constructions of the study**

Terms / terminological constructions	Conceptual understanding within the study	Empirical interpretation within the study	Referent science
Territorial analytic data, TAD	Input data that are periodically gathered and updated to support territorial management processes (diagnostics, planning, decision-making, etc.), helping ensure that these processes consider the current state of natural, cultural, and socioeconomic factors	Statistical, documental and sociological data of Latvian municipalities	Data Science
Machine diagnostics of the local territorial development	A new method for spatial planning that merges machine learning, big data, and spatial analysis to facilitate targeted, sustainable, and data-informed territorial planning, which positioned as a transformative tool for addressing complex spatial planning challenges, offering both technical advancements and practical frameworks for improving local territorial development	SWOT-analysis conducted by AI tool using standard techniques of extracting and summarising key points from the analysed document. The task for AI tool (ChatGPT 4o): Based on the attached Public Report 2023 (in Latvian), conduct a SWOT analysis to understand the strengths, weaknesses, opportunities and threats for the municipality.	Computer science & Regional economics

*Source: own elaborated based on Simonova & Sykora, 2011a, 2011b; Sen et al., 2023; Xue et al., 2024.*



Regarding territorial analytic data (TAD) (Table 1.1), the authors use the conceptual understanding and empirical interpretation of the term proposed by Simonova and Sykora (2011a, 2011b). They define TAD as a crucial tool in territorial planning, describing it as an essential input for creating the "Principles of territorial development" (Simonova & Sykora, 2011a, 2011b). TAD includes data that are periodically gathered and updated to support decision-making processes for regional planning, helping ensure that planning considers the current state of natural, cultural, and socioeconomic factors. The creation and management of TAD are important steps in regional development to achieve sustainable, balanced growth while coordinating public and private interests (Simonova & Sykora, 2011a, 2011b). Simonova and Sykora do not create the term "territorial analytic data" (TAD) themselves. Instead, they refer to it within the context of established territorial planning practices and legal frameworks. They cite regional legislation and strategic documents (for example, European Spatial Development Perspective, Law No. 183/2006 Sb. of the Czech Republic) that use and define TAD as a standard tool or "default tool" for territorial planning. Specifically, TAD is described as an input for the broader "Principles of territorial development", aligning with legislative norms and requirements for regional planning (Simonova & Sykora, 2011a, 2011b).

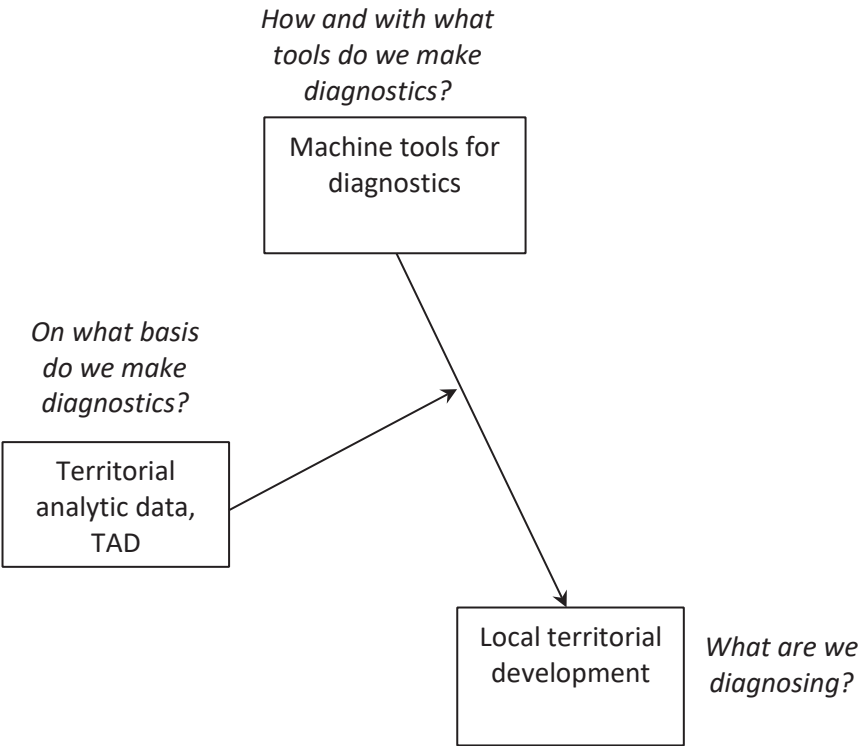
In turn, machine diagnostics of local territorial development is conceptually understood as a new method for spatial planning that merges machine learning, big data, and spatial analysis to facilitate targeted, sustainable, and data-informed territorial planning (Sen et al., 2023). Artificial intelligence and data processing advances are set to refine diagnostics, enabling more accurate, localised, and actionable territorial insights. While machine learning provides significant advancements, challenges remain in data mining, small-scale spatial studies, and multi-source data integration. Overall, Xue et al. position machine learning as a transformative tool for addressing complex spatial planning challenges, offering both technical advancements and practical frameworks for improving local territorial development (Xue et al., 2024).

Within this study, machine diagnostics of local territorial development is empirically interpreted as SWOT-analysis conducted by AI tool using standard techniques of extracting and summarising key points from the documents – annual public reports of Latvian municipalities (Table 1.1). The output of this analysis will be SWOT-matrixes of territories (European Commission, 2024). According to the definition of the European Commission, SWOT-analysis is a strategic tool for use in context analysis. The acronym refers to the domains it

considers: Strengths, Weaknesses, Opportunities and Threats. It combines an assessment of the strengths and weaknesses of an organisation, geographical area or sector to evaluate the opportunities and threats the environment poses. SWOT-analysis considers internal and external factors to maximise the potential of strengths and opportunities while minimising the impact of weaknesses and threats (European Commission, 2024).

Three interrelated structuring questions (Figure 1.1) emerged from the conceptual understanding and empirical interpretation of machine diagnostics of local territorial development (Table 1.1):

- (1) What are we diagnosing? – Local territorial development.
- (2) How and with what tools do we make diagnostics? – Machine tools for diagnostics.
- (3) On what basis do we make diagnostics? – Territorial analytic data, TAD.



**Fig. 1.1. Interrelation of main structuring questions and terms / terminological constructions of the study**  
*Source: own elaborated based on Table 1.1.*

### **1.3. Conceptual framework and methodology of data-based machine diagnostics of the local territorial development**

In this study, the authors will use the methodological approach of discourse analysis (van Dijk, 1976, 2006; Komarova & Koroļova, 2021; Mietule et al., 2022), placing the diagnosed territories in the broader context of their sustainable development (including social, economic and environmental aspects). Considering the context of local territorial development, the conceptual framework of data-based machine diagnostics of local territorial development includes the following sequent mandatory concepts (without them, data-based machine diagnostics of the local territorial development is impossible) (Figure 1.2):

- (1) Input for diagnostics – territorial analytic data, TAD;
- (2) The subject of diagnostics – the context of the local territorial development and the state of development of territories;
- (3) Method of diagnostics – cluster analysis of territories and SWOT analysis of territories;
- (4) Machine tool for diagnostics - Statistical Package for Social Sciences (IBM SPSS) and Chat Generative Pre-Trained Transformer (ChatGPT 4o);
- (5) Result of diagnostics – developmental types of territories and SWOT matrixes of territories;
- (6) Output of diagnostics – the strengths, weaknesses, opportunities and threats for each territory in the context of the local territorial development.

As for territorial framework of this study, the authors propose (based on the literature review (Dobrinevski & Jachnik, 2020; Din et al., 2022; Rehman, et al., 2023; Komarova et al., 2024; Queiroz et al., 2024), as well as the predictive empirical analysis of Latvian statistical data) to divide Latvia into three types of territories in the context of the economic productivity and environmental sustainability of these territories. As it was already mentioned in the introduction of this study, the research object is Latvian municipalities. The administrative division of Latvia into municipal territories (36 counties and 7 cities of national importance that are not part of the counties) is such from July 1, 2021, in accordance with the Law of the Republic of Latvia “On Administrative Territories and Settlements” (Saeima of Latvia, 2020). All municipalities of Latvia, both counties and cities of national importance, were included in the study sample, which ultimately consisted of 43 objects and coincided with the population (in statistical analysis – the entire set of items from which you draw data for a statistical study) of Latvian municipalities. Such a relatively small number of objects can be

analyzed by statistical methods (Kish, 1965) but requires increased attention to the statistical significance of the results obtained.

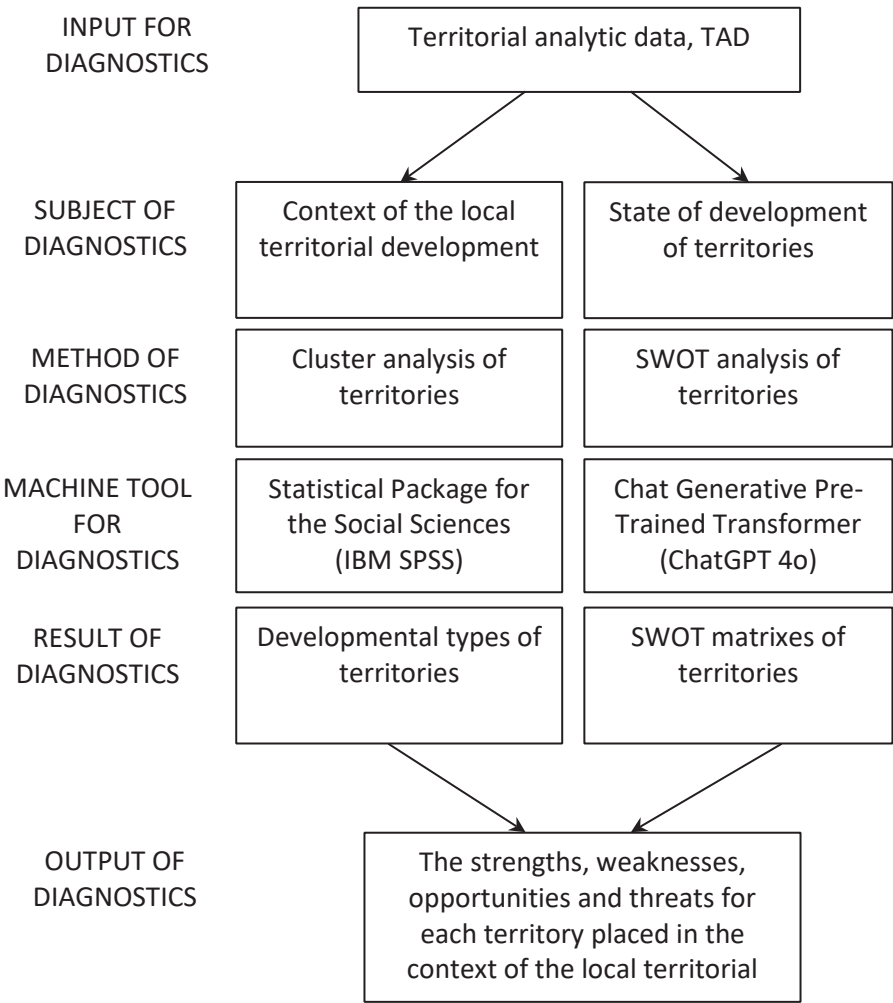
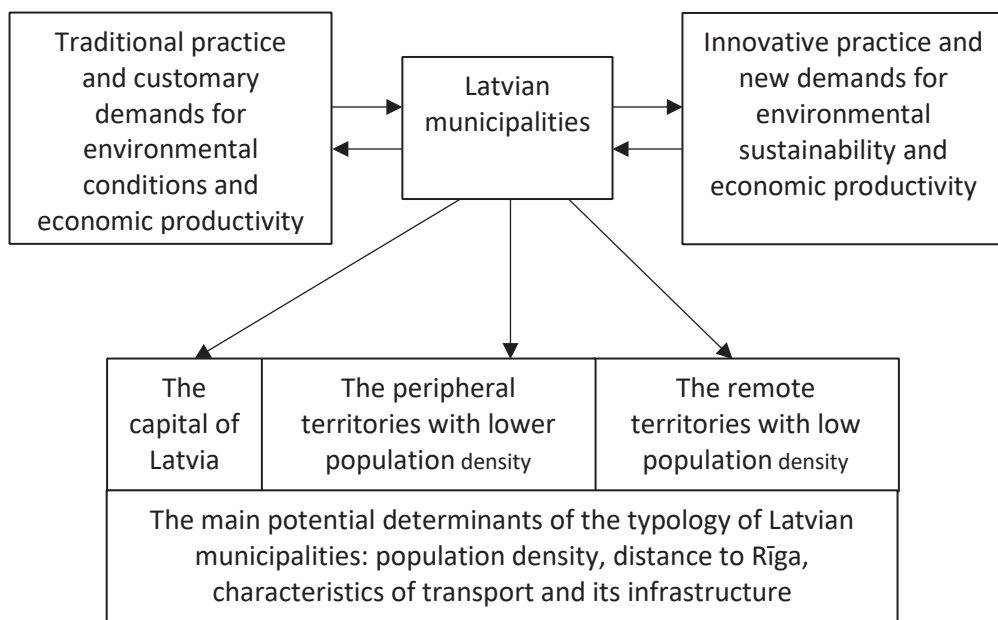


Fig. 1.2. **Conceptual framework of data-based machine diagnostics of local territorial development**

Source: own elaborated based on Simonova & Sykora, 2011a, 2011b; Sen et al., 2023; Xue et al., 2024.



**Fig. 1.3. The systemic analysis of the object (Latvian municipalities) and the subject (transportation efficiency in them) of the study, including the forces acting on them (and vice versa) and the result of this mutual influence**

*Source: own elaborated based on Dobrinevski & Jachnik, 2020; Din et al., 2022; Rehman, et al., 2023; Komarova et al., 2024; Queiroz et al., 2024.*

The systemic analysis of the research object (Latvian municipalities) began with the forces (processes) acting on Latvian municipalities and vice versa. These forces are traditional practice and customary demands for environmental conditions and economic productivity, on the one hand, and innovative practice and new demands for environmental sustainability and economic productivity, on the other hand. As a result of this mutual influence, we can theoretically get three types of territories in Latvia: the capital of Latvia, the peripheral territories with lower population density and the remote territories with low population density. The main potential determinants of the typology of Latvian municipalities (which need to be tested empirically in further quantitative analysis of statistical data): population density, distance to Rīga, characteristics of transport and its infrastructure.

The next methodological issue of empirical verification of the above theoretical systemic analysis is the empirical interpretation of conceptual constructs with a view to their practical measurement in Latvian municipalities.

The following table shows both the conceptual constructs used in the systemic analysis of the object and subject of the study, and their empirical interpretation based on the ideas from the reviewed scientific literature and data provided by Latvian statistics.

Table 1.2

Conceptual constructs used in the systemic analysis of the research object, and their empirical interpretation

Conceptual constructs	Empirical interpretation within the study, data for 2022 or 2023
Economic productivity (in territories)	GDP per capita, EUR Average annual income tax per capita, EUR
Environmental sustainability (in territories)	Greenhouse gases (CO <sub>2</sub> , N <sub>2</sub> O, CH <sub>4</sub> , HFC and SF <sub>6</sub> in CO <sub>2</sub> equivalent) (GHG) per capita, kg of CO <sub>2</sub> equivalent GHG per km <sup>2</sup> of area, thousand tons in CO <sub>2</sub> equivalent
Characteristics of transport (in territories)	Share of the electric passenger cars, % of the registered passenger cars
Characteristics of transport infrastructure (in territories)	Share of asphalt and other bituminous surfaces, % of roads Roads density, km of roads (state and municipal roads and streets) per km <sup>2</sup> of area
General determining characteristics of territories	Population density, number of inhabitants per km <sup>2</sup> of area Distance to Riga, km

Source: own elaborated based on Balodis, 2022; Komarova et al., 2024; Central Statistical Bureau (Latvia), 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g; State Treasury of Latvia, 2024.

Since the influence between Latvian municipalities and the practice / demands for environmental sustainability / economic productivity is mutual, correlation analysis with the Pearson coefficient is useful here in order to quantify the relationship between the research object and the forces (processes) interconnected with it (Fig. 1.3). Then, those of the main potential determinants of the typology of Latvian municipalities, which statistically significantly correlate with the selected indicators of economic productivity and environmental sustainability of Latvian municipalities, will participate in further cluster analysis (Section 2.1 of this study) in order to identify empirical types of Latvian territories (Fig. 1.3, Table 1.2). The authors believe that development

context of each type of identified Latvian territories is necessary for further SWOT-analysis (Section 2.2 of this study).

After typologizing the Latvian territories, SWOT-analysis of local territorial development will be carried out in order to understand the strengths, weaknesses, opportunities and threats associated with each specific municipality in the context of typological clusters of Latvian municipalities. SWOT-analysis will be conducted by AI tool using standard techniques of extracting and summarising key points from the analysed document (in this study, an annual public report of a municipality). The task for AI tool (ChatGPT 4o) will be as follows: Based on the attached Public Report 2023 (in Latvian), conduct a SWOT analysis to understand the strengths, weaknesses, opportunities and threats for the municipality. According to the European Commission, a SWOT-analysis is a strategic analysis tool for use in context analysis (European Commission, 2024). SWOT-analysis considers internal and external factors to maximise the potential of strengths and opportunities, while minimising the impact of weaknesses and threats.

Data-based diagnostics of local territorial development can be also conceptually understood as a modelable business process (Kudins et al., 2024). A business process is a series of tasks or activities that are systematically organized and implemented to achieve a specific organizational goal (Weske, 2012). These processes can vary greatly in complexity and scope, ranging from simple procedures like ordering supplies to intricate workflows like product development and supply chain management (Aalst & Hee, 2002). Key characteristics of a business process include (Aalst, 2016): (1) **defined sequence of steps** (a clear sequence of activities that need to be performed), but sometimes a business process includes also parallel activities, which are not dependent on each others completion and can be done parallel (Ng, 2024); (2) **objective or goal** (a specific outcome or goal that the process aims to achieve); (3) **inputs and outputs** (resources or information that are processed to produce a final output); (4) **participants** (individuals, teams or systems involved in executing the process); (5) **rules and policies** (guidelines that dictate how tasks should be performed).

In different sources, the definition and key elements of a business process may be defined slightly differently, but the essential component of a business process, which distinguishes it from all other processes, is its repeatability (regularity). In turn, all processes occurring at the stage of formation and initial development of an organization are not business processes, since they have a trial, unsettled nature. As for the key elements of a business process displayed

in its model, then, with variations in definitions and terminology from different sources, they always include the four key points used in the older, widely spread and still applicable IDEF0 models (IDEF0, 1993): inputs (in the business process diagram it is always to the left of the block depicting one of the sequential steps of business process), outputs (always to the right), mechanisms (always from below) and controls (always from above).

The following figure shows the generally modeled business process of data-based machine diagnostics of local territorial development through creation of annual public reports in Latvian municipalities.

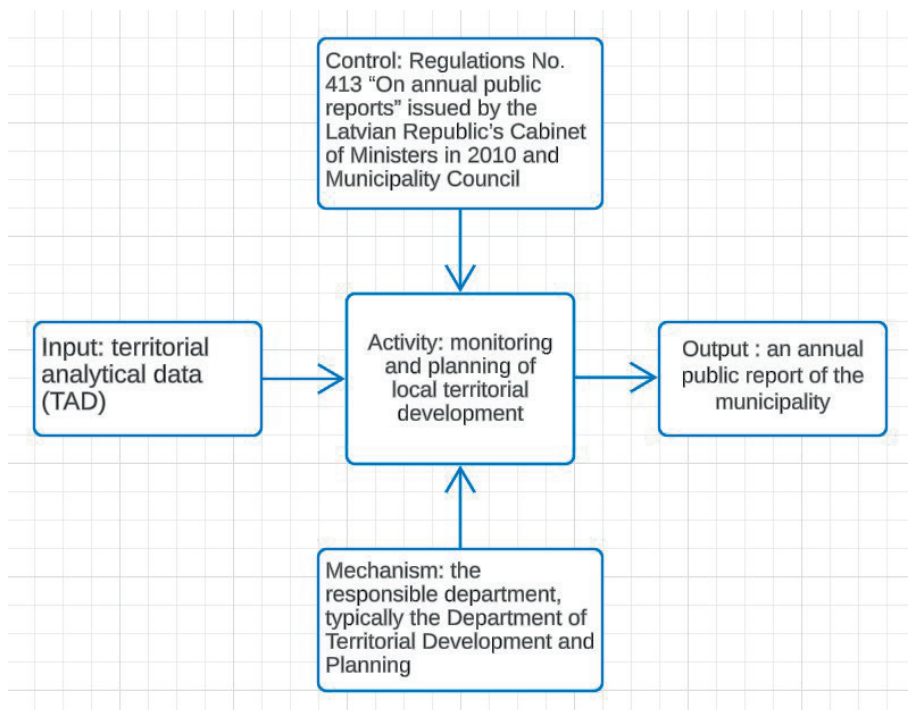


Fig. 1.4. **Common IDEF0 diagram of data-based machine diagnostics of local territorial development through creation of annual public reports in Latvian municipalities**

Note:

- **Activity:** the main activity is "Monitoring and planning of local territorial development";



- **Control:** the activity is governed by Regulations No. 413 “On annual public reports” issued by the Cabinet of Ministers (Latvia) in 2010 and Municipal Council;
- **Mechanism:** the activity is carried out by the responsible department, typically the Department of Territorial Development and Planning;
- **Input:** the process uses territorial analytical data (TAD) as input;
- **Output:** the result of the process is an annual public report of the municipality.

Source: **own** elaborated using IDEF0 software and based on Kallian et al., 2004.

When applied to the context of local territorial development, a business process encompasses the system approach taken to assess, plan and implement strategies for the improvement and growth of a specific geographic area. This involves a series of interrelated activities aimed at diagnosing current conditions and planning future developments (Mickevičius et al., 2022). While commercial organizations apply process management methods, because they accept it as necessity in light of long-term high performance achievements, services of public administration are not yet process managed (Simonova & Sykora, 2011a). That is not because public administration organizations would not be interested in application of methods of monitoring and managing quality. The reason is that the services they provide have specific characteristics (for example, legal framework) (Simonova & Sykora, 2011a; Maksin, 2014), which determine processes efficiency in local municipalities (Marks-Bielska & Kurowska, 2017; Marks-Bielska et al., 2020).

The authors believe that business process modeling for data-based machine diagnostics of local territorial development increases the level of this development, but is not widely used in Latvian municipalities. This hypothesis will be tested through statistical analysis of survey data of administrative staff responsible for the creation of annual public reports in Latvian municipalities or actively involved in this process (n = 43, May–June 2024) (Section 2.3 of this study).

Business process modeling (BPMdl) is the base for business process management (BPMng) in municipalities (Simonova & Sykora, 2011a). Evaluating business process modeling in relation to each element of business process management (strategic alignment, governance, methods, information technology, people and culture (Rosemann & Brocke, 2010)) can be effectively realized using a maturity model framework (Lee et al., 2007). A maturity model helps evaluate the current state and guides the improvement by providing a

structured approach to measure various aspects of processes and their management. One of the well-known frameworks for this purpose is the maturity model tailored for business process management, such as the Business Process Maturity Model (BPMM) (Lee et al., 2007; Bridges, 2024).

The following table shows methodology of evaluating **business process modeling** in relation to each element of business process management using a maturity model framework.

Table 1.3

**Methodology of evaluating business process modeling (BPMdl)  
in the context of business process management (BPMng)**

BPMdl maturity levels	Core elements of business process management (BPMng)					Culture
	Strategic alignment*	Governance	Methods	Information technology	People	
	Business process modeling (BPMdl) maturity levels and evaluations					
1 (initiales)**	No alignment between BPMdl and organiza- tion's strategy	No governance structure for BPMdl	Ad hoc methods used for BPMdl	Basic or no IT support for BPMdl	Limited knowledge and skills in BPMdl	No established culture for BPMdl.
2 (managed)	Some processes are aligned with organiza- tion's strategy	Informal governance structures in place	Documented but incon- sistent methods	Specific tools are used inconsistently	Specific roles are assigned but training is inconsistent	Awareness of the importance of BPMdl in certain areas
3 (defined)	BPMdl consistently aligned with strategic goals	Defined roles and responsi- bilities for overseeing BPMdl	Standardized methods and tools for BPMdl	Standardized IT tools and infrastructure support BPMdl.	Standardized training prog- rams and knowledge- sharing practices	Organization- wide cultural practices supporting BPMdl

4 (quantitatively managed)	Quantitative metrics to ensure alignment between processes and strategic objectives	Performance-based governance structures with clear accountability	Regular evaluation and improvement of BPMdl methods	Integrated IT solutions with performance metrics for BPMdl	Quantitative metrics to evaluate the skills and performance of individuals involved in BPMdl	Quantitative cultural assessments to measure engagement and attitudes towards BPMdl
5 (optimizing)	Continuous review and adjustment of processes to maintain strategic alignment	Adaptive governance practices that evolve based on performance feedback	improving methods based on best practices and feedback	Continuous IT innovation to support and enhance BPMdl	Continuous skills improvement and innovation in BPMdl practices	A culture of continuous improvement and innovation in BPMdl

\* Strategic alignment – ensures processes align with organizational strategy;

Governance – establishes accountability and decision-making structures;

Methods – tools and techniques supporting BPMdl activities;

Information technology – IT solutions supporting process activities;

People – skills and knowledge of individuals managing processes;

Culture – process-related collective values and beliefs.

\*\* BPMdl maturity levels scale:

1 (inities!) – processes are unstructured and unpredictable, success depends on individual effort and heroics;

2 (managed) – processes are defined and documented but might not be standardized, practices are repeatable;

3 (defined) – processes are standardized, documented and communicated across the organization, there are established standards and guidelines;

- 4 (quantitatively managed) – processes are measured and controlled, there is a focus on quantitative performance management;
- 5 (optimizing) – continuous process improvement is enabled by quantitative feedback and innovative ideas.

*Source: own elaborated based on Lee et al., 2007; Bridges, 2024.*

The sequence and methodology of conducting the evaluation of business process modeling in relation to each element of business process management for some particular organization is the following (based on Lee et al., 2007; Bridges, 2024):

- (1) survey and interviews: distribution of the evaluation table to relevant stakeholders and conduct interviews to gather detailed information;
- (2) document review: review of the existing process documentation, governance structures, training programs and IT tools;
- (3) data analysis: analysis of the collected data to determine the maturity level of business process modeling in relation to each element of business process management;
- (4) reporting: compilation of the findings highlighting current maturity levels and providing recommendations for improvement.

Data mining will be used to test the hypothesis that business process modeling for data-based machine diagnostics of local territorial development increases the level of this development, but is not widely used in Latvian municipalities.. Two levels of local territorial (in particular, economic) development of Latvian municipalities (municipalities with a less developed economy and municipalities with a more developed economy) are defined as in the study “Latvian Municipal Budget Expenditures on Transport Infrastructure and Production in the Context of Improving the Local Economy” (Komarova et al., 2024): the economy of a municipality can be empirically interpreted as a less developed if it has the average annual income tax per capita below the mean, and as a more developed if it has the average annual income tax per capita above the mean. These two groups of municipalities are target groups (variables) in statistical analysis, but BPMdl maturity level in relation to each element of BPMng (strategic alignment, governance, methods, information technology, people and culture – Table 1.3) served as potential determinants. Data mining methods such as comparison of means, correlation and regression analysis, and discriminant analysis will be applied in order to identify statistically significant aspects of business process modeling that influence local economic development.

#### **1.4. Territorial analytic data (TAD) architecture and data system used in the study**

Within this study, territorial analytic data (TAD) is conceptualized as a critical input for territorial planning and diagnostics (Figure 1.2). It includes data that is periodically collected and updated to support decision-making in regional planning (Simonova & Sykora, 2011a, 2011b). TAD is positioned as a standard tool for territorial planning, referenced in established practices and legal frameworks like the European Spatial Development Perspective. This data ensures that planning processes account for the current state of natural, cultural, and socioeconomic factors, helping achieve sustainable and balanced regional development while coordinating public and private interests.

In data science, architecture of the data describes the high-level organization, flow, and management of data in a system or study, often encompassing multiple sources and types of data (Inmon & Linstedt, 2015; Sherman, 2015). It involves conceptualizing how data from various sources (e.g., statistical reports, surveys, documents) integrates into the research or analysis framework.

In the framework of this study, the data does not represent a single unified database but consists of three interrelated (by common object – Latvian municipalities) and separate (by data type) databases:

- (1) statistical database: the set of quantitative data collected from official sources like the Central Statistical Bureau of Latvia and the State Treasury of Latvia for the years 2022–2023 (this includes economic, demographic, and environmental metrics of Latvian municipalities);

Table 1.4

## Developmental indicators of Latvian municipalities used in the study, N = 43, 2022–2023

Latvian municipalities	Share of the electric passenger cars, %	Share of asphalt and other bituminous surfaces, %	Roads density, km	Population density, persons	Distance to Rīga, km	GDP per capita, EUR	Income tax per capita, EUR	GHG per capita, kg	GHG per km <sup>2</sup> of area, thsd t
Riga City	5.7	72.3	3.96	2,309	0	28,943.00	1,159.68	3,712.09	7.42
Daugavpils City	1.2	65.5	4.60	1,244	232	10,746.00	575.53	2,849.24	3.11
Yelgava City	3.4	52.6	4.46	951	41	13,462.00	870.13	2,470.92	2.23
Yurmala City	16.9	68.9	3.94	575	20	10,002.00	1,198.65	2,497.69	1.25
Liepaya City	2.3	73.4	3.98	1,307	195	15,565.00	724.85	2,759.02	2.73
Rezekne City	0.7	70.8	6.06	1,541	242	13,540.00	636.60	4,312.50	6.51
Ventspils City	2.7	87.0	3.33	645	189	13,900.00	907.74	2,923.04	1.66
Aizkraukle County	1.0	28.4	0.73	13	87	12,095.00	707.41	6,255.43	0.08
Aluksne County	0.5	22.6	0.69	8	202	8,361.00	594.00	5,767.74	0.05



Augshdau gava County	0.6	22.8	1.12	10	228	5,620.00	457.23	7,902.10	0.08
Adazhi County	9.8	44.5	1.52	101	26	11,208.00	1,248.18	2,714.73	0.25
Balvi County	0.6	22.6	0.67	8	220	6,238.00	526.55	7,147.52	0.06
Bauska County	1.7	22.5	0.95	19	67	9,228.00	704.75	6,172.24	0.12
Cesis County	1.7	21.3	1.00	16	88	10,525.00	758.44	6,075.48	0.09
Dienvidkur zeme County	0.9	20.3	0.86	10	195	10,046.00	633.14	7,711.01	0.07
Dobele County	1.3	27.6	0.94	18	74	12,778.00	794.48	8,525.60	0.15
Gulbene County	1.0	21.6	0.74	10	183	11,435.00	651.75	6,942.59	0.07
Yelgava County	1.7	33.2	1.01	21	41	10,071.00	797.35	5,813.91	0.12
Yekabpils County	0.7	19.2	0.80	14	143	10,753.00	615.12	6,317.42	0.08
Kraslava County	1.3	19.0	0.95	9	264	6,847.00	426.00	7,294.89	0.07
Kuldiga County	1.3	26.7	0.79	11	150	10,604.00	632.19	6,520.41	0.07

Kekava County	6.8	39.4	1.11	73	17	19,030	1,161.31	3,827.47	0.27
Limbazhi County	0.9	22.8	0.93	12	82	9,691.00	677.47	5,660.27	0.07
Livani County	2.0	37.2	0.72	17	151	14,109.00	547.19	6,721.49	0.11
Ludza County	1.2	19.3	0.90	9	225	8,093.00	478.84	4,858.55	0.04
Madona County	0.8	20.9	0.80	9	153	11,425.00	629.77	6,998.35	0.06
Marupe County	9.4	61.9	1.18	118	11	30,248.00	1,384.93	5,007.26	0.51
Ogre County	3.8	31.2	1.18	33	34	8,213.00	940.14	3,752.28	0.12
Olaine County	2.6	63.2	0.65	69	20	14,629.00	923.84	3,383.11	0.22
Preili County	0.6	22.7	1.01	12	215	7,948.00	516.07	9,439.67	0.11
Rezekne County	1.2	23.0	0.94	11	242	6,633.00	451.93	6,805.01	0.07
Ropazhi County	7.0	41.4	1.14	66	36	23,416.00	1,167.05	6,373.45	0.40
Salaspils County	5.8	62.6	1.46	234	18	10,664.00	962.38	2,723.29	0.52
Saldus County	1.0	25.7	0.76	12	119	13,061.00	693.59	3,626.93	0.04

Saulkrasti County	3.4	34.4	1.40	36	48	11,747.00	986.02	3,752.96	0.13
Sigulda County	5.0	33.8	1.04	31	51	12,345.00	973.87	4,710.13	0.14
Smiltene County	0.6	28.3	0.79	10	127	17,840.00	676.77	9,199.04	0.09
Talsi County	0.8	31.4	0.78	13	115	10,863.00	636.25	5,255.05	0.07
Tukums County	1.8	31.1	0.89	19	69	9,554.00	719.24	5,938.84	0.11
Valka County	0.6	30.7	0.54	9	140	8,950.00	818.88	5,405.59	0.04
Valmiera County	1.2	34.3	0.70	18	107	14,045.00	822.96	6,121.41	0.11
Varaklani County	3.2	29.5	0.84	11	191	9,590.00	489.52	7,055.22	0.07
Ventspils County	1.0	25.7	0.60	4	189	12,388.00	674.94	9,481.16	0.04

Description of the indicators (based on the methodological Table 1.2):

- Share of the electric passenger cars, % – Share of the electric passenger cars, % of the registered passenger cars;
- Share of asphalt and other bituminous surfaces, % – Share of asphalt and other bituminous surfaces, % of roads;
- Roads density, km – Roads density, km of roads (state and municipal roads and streets) per km<sup>2</sup> of area;
- Population density, persons – Population density, number of inhabitants per km<sup>2</sup> of area;
- Distance to Rīga, km – Distance to Rīga, km;
- GDP per capita, EUR – GDP per capita, EUR;

- Income tax per capita, EUR – Average annual income tax per capita, EUR;
- GHG per capita, kg – Greenhouse gases (CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFC and SF<sub>6</sub> in CO<sub>2</sub> equivalent) (GHG) per capita, kg of CO<sub>2</sub> equivalent;
- GHG per km<sup>2</sup> of area, thsd t – GHG per km<sup>2</sup> of area, thousand tons in CO<sub>2</sub> equivalent.

*Source: own elaborated using MS Excel software and data from Central Statistical Bureau (Latvia), 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g; State Treasury of Latvia, 2024.*

- (2) documental database: the set of textual files with annual public reports (2023) from Latvian municipalities accessible on the web-page of the Ministry of Smart Administration and Regional Development (this provides detailed information about the municipalities' activities, financial status, strategic developments and community engagement over the past year) (Ministry of Smart Administration and Regional Development (Latvia), 2024);

Table 1.5

Description of database of Public Reports 2023 of Latvian municipalities,  
N = 43

No.	Name of the municipality (in English)	Name of the municipality (in Latvian)	Region	Number of pages in the Report
1.	Riga City	<i>Rīgas pilsēta</i>	Riga	34 pages
2.	Ventspils City	<i>Ventspils pilsēta</i>	Kurzeme	108 pages
3.	Yelgava City	<i>Jelgavas pilsēta</i>	Zemgale	74 pages
4.	Yurmala City	<i>Jūrmalas pilsēta</i>	Pieriga	82 pages
5.	Daugavpils City	<i>Daugavpils pilsēta</i>	Latgale	106 pages
6.	Liepaya City	<i>Liepājas pilsēta</i>	Kurzeme	98 pages
7.	Rezekne City	<i>Rēzeknes pilsēta</i>	Latgale	92 pages
8.	Adazhi County	<i>Ādažu novads</i>	Pieriga	59 pages
9.	Aizkraukle County	<i>Aizkraukles novads</i>	Pieriga	108 pages
10.	Bauska County	<i>Bauskas novads</i>	Zemgale	102 pages
11.	Cesis County	<i>Cēsu novads</i>	Vidzeme	29 pages
12.	Dobele County	<i>Dobeles novads</i>	Zemgale	85 pages
13.	Kekava County	<i>Ķekavas novads</i>	Pieriga	70 pages
14.	Limbazhi County	<i>Limbažu novads</i>	Pieriga	69 pages
15.	Marupe County	<i>Mārupes novads</i>	Pieriga	67 pages
16.	Ogre County	<i>Ogres novads</i>	Pieriga	66 pages
17.	Olaine County	<i>Olaines novads</i>	Pieriga	175 pages
18.	Ropazhi County	<i>Ropažu novads</i>	Pieriga	30 pages
19.	Salaspils County	<i>Salaspils novads</i>	Pieriga	53 pages
20.	Saulkrasti County	<i>Saulkrastu novads</i>	Pieriga	66 pages
21.	Sigulda County	<i>Siguldas novads</i>	Pieriga	99 pages
22.	Tukums County	<i>Tukuma novads</i>	Kurzeme	130 pages
23.	Valmiera County	<i>Valmieras novads</i>	Vidzeme	116 pages
24.	Yelgava County	<i>Jelgavas novads</i>	Zemgale	83 pages

25.	Aluksne County	<i>Alūksnes novads</i>	Vidzeme	141 pages
26.	Augšdaugava County	<i>Augšdaugavas novads</i>	Latgale	64 pages
27.	Balvi County	<i>Balvu novads</i>	Latgale	111 pages
28.	Dienvidkurzeme County	<i>Dienvidkurzemes novads</i>	Kurzeme	69 pages
29.	Gulbene County	<i>Gulbenes novads</i>	Vidzeme	54 pages
30.	Kraslava County	<i>Krāslavas novads</i>	Latgale	100 pages
31.	Kuldīga County	<i>Kuldīgas novads</i>	Kurzeme	129 pages
32.	Līvāni County	<i>Līvānu novads</i>	Latgale	62 pages
33.	Ludza County	<i>Ludzas novads</i>	Latgale	53 pages
34.	Madona County	<i>Madonas novads</i>	Vidzeme	85 pages
35.	Preiļi County	<i>Preiļu novads</i>	Latgale	45 pages
36.	Rezekne County	<i>Rēzeknes novads</i>	Latgale	55 pages
37.	Saldus County	<i>Saldus novads</i>	Kurzeme	50 pages
38.	Smiltene County	<i>Smiltenes novads</i>	Kurzeme	94 pages
39.	Talsi County	<i>Talsu novads</i>	Kurzeme	95 pages
40.	Valka County	<i>Valkas novads</i>	Vidzeme	68 pages
41.	Varaklani County	<i>Varakļānu novads</i>	Latgale	51 pages
42.	Ventspils County	<i>Ventspils novads</i>	Kurzeme	68 pages
43.	Yekabpils County	<i>Jēkabpils novads</i>	Zemgale	44 pages

Sources: own elaborated based on Ministry of Smart Administration and Regional Development (Latvia), 2024.

- (3) sociological database: the set of quantitative data gathered through the survey (May–June 2024) of administrative staff in Latvian municipalities who are involved in preparing annual public reports of municipalities (this provides insights into the processes and perceptions related to business process modeling and territorial development).

**Table 1.6**  
**Survey data on the maturity level of business process modeling (BPMdl) in relation to each element of business process management (BPMng) and economic indicators, Latvian municipalities, N = 43, \* 2024**

Latvian municipalities	Core elements of Business Process Management (BPMng)						Average annual income tax per capita, eur	Level of economic development
	Strategic Alignment**	Governance	Methods	Information Technology	People	Culture		
Adazhi County	4	2	3	4	3	3	1248,18	2
Aizkraukle County	4	3	2	3	2	1	707,41	1
Aluksne County	3	3	1	3	1	2	594,00	1
Augshdaugava County	4	2	1	4	2	2	457,23	1
Balvi County	4	3	1	3	1	1	526,55	1
Bauska County	4	3	2	3	1	1	704,75	1
Cesis County	3	2	2	4	1	1	758,44	1
Daugavpils City	5	4	1	4	2	2	575,53	1
Dienvidkur-zeme County	3	3	1	3	2	1	633,14	1
Dobele County	3	2	2	4	4	3	794,48	2
Gulbene County	4	3	1	3	2	3	651,75	1
Kekava County	3	3	3	3	1	4	1161,31	2
Kraslava County	4	2	2	4	3	1	426,00	1

Kuldīga County	4	3	2	4	3	1	632,19	1
Liepāja City	5	3	1	4	2	1	724,85	1
Limbazhi County	4	5	1	3	1	2	677,47	1
Livani County	4	2	1	3	1	1	547,19	1
Ludza County	3	3	1	4	2	2	478,84	1
Madona County	4	3	2	3	1	1	629,77	1
Marupe County	4	4	2	4	1	3	1384,93	2
Ogre County	5	3	3	3	3	3	940,14	2
Olaine County	4	3	3	3	4	3	923,84	2
Preiļi County	4	2	1	4	4	1	516,07	1
Rezekne City	5	4	2	4	2	2	636,60	1
Rezekne County	3	3	2	3	1	1	451,93	1
Ropazhi County	4	4	3	3	3	4	1167,05	2
Rīga City	5	5	4	4	3	4	1159,68	2
Salaspils County	4	4	3	4	4	3	962,38	2
Saldus County	3	2	2	2	1	1	693,59	1
Saulkrasti County	3	3	2	3	3	3	986,02	2
Sigulda County	4	3	3	3	3	3	973,87	2
Smiltene County	3	2	1	2	2	1	676,77	1
Talsi County	4	3	2	4	1	2	636,25	1
Tukums County	4	3	1	3	2	1	719,24	1
Valka County	4	3	1	4	4	3	818,88	2
Valmiera County	4	3	3	4	2	2	822,96	2
Varaklani County	3	3	1	2	1	1	489,52	1
Ventspils City	3	4	3	4	3	4	907,74	2



Ventspils County	3	3	2	2	2	1	674,94	1
Yekabpils County	4	2	1	3	1	1	615,12	1
Yelgava City	5	4	2	3	4	3	870,13	2
Yelgava County	4	3	2	3	3	3	797,35	2
Yurmala City	5	4	3	3	4	3	1198,65	2

\* The estimates were provided by the administrative staff responsible for creating the annual public reports of Latvian municipalities or actively involved in this process.

\*\* Strategic Alignment – ensures processes align with organizational strategy;

Governance – establishes accountability and decision-making structures;

Methods – tools and techniques supporting BPMdl activities;

Information Technology – IT solutions supporting process activities;

People – skills and knowledge of individuals managing processes;

Culture – process-related collective values and beliefs.

\*\*\* Maturity levels scale:

1 (initials) – processes are unstructured and unpredictable, success depends on individual effort and heroics;

2 (managed) – processes are defined and documented but might not be standardized, practices are repeatable;

3 (defined) – processes are standardized, documented and communicated across the organization, there are established standards and guidelines;

4 (quantitatively managed) – processes are measured and controlled, there is a focus on quantitative performance management;

5 (optimizing) – continuous process improvement is enabled by quantitative feedback and innovative ideas.

\*\*\*\* 1 – less developed municipality (has the average annual income tax per capita below the mean); 2 – more developed municipality (has the average annual income tax per capita above the mean).

Source: own collected data (May–June 2024), calculated based on the methodology from Komarova et al., 2024 and data from State Treasury (Latvia), 2024.

These databases are used collectively in the research to diagnose local territorial development but remain distinct in terms of their origins and nature. The next table presents the general architecture of territorial analytic data (TAD) used in the study, including the following elements ((Inmon & Linstedt, 2015): (1) data sources (the origins of the data used in the study); (2) data types (the nature and format of the data.); (3) data collection methods (how the data is gathered); (4) data structure (how the data is organized and formatted); (5) data storage (how the data is organized and formatted); (6) data integration (how data from different sources or types is combined); (7) data access and querying (the mechanisms for accessing and interacting with the data); (8) data processing and analysis (the tools and methods used to process and analyze the data); (9) data security and privacy (measures to ensure data protection and compliance); (10) outputs and deliverables (the results or insights derived from the data).

Table 1.7

**Architecture of territorial analytic data (TAD) used in the study**

Elements of data architecture	Statistical database	Documentual database	Sociological database
Data sources	Official data covering 2022–2023, from Central Statistical Bureau and State Treasury of Latvia	Annual public reports (2023) of Latvian municipalities submitted to the Ministry of Smart Administration and Regional Development (Latvia)	Survey conducted in May–June 2024; respondents – administrative staff of Latvian municipalities involved in preparing annual public reports
Data types	Quantitative data, including economic, demographic, and environmental metrics	Textual data in the form of descriptive and financial reports	Quantitative data derived from survey responses on maturity levels of business process modeling (BPMdl) in relation to each element of business process management (BPMng)

Data collection methods	Data is gathered or calculated from official databases	Data is downloaded from the website of the Ministry of Smart Administration and Regional Development (Latvia)	A structured survey using the Business Process Maturity Model (BPMM) (Lee et al., 2007; Bridges, 2024) – <b>Table 1.3</b>
Data structure	Data is structured in <b>tabular format</b> (rows and columns), each row represents a specific municipality, and each column corresponds to a quantitative indicator or metric	Unstructured or semi-structured textual data compiled into a centralized digital repository for analysis (organized by municipality and report year); metadata (Table 1.5) includes municipality name, region, number of pages in the report	Data is structured in <b>tabular format</b> , with rows representing responses from individual municipalities and columns corresponding to survey items; includes numerical scale (maturity levels) and categorical data (municipality classification)
Data storage	Data for the study is stored in relational databases (MS Excel and CSV files), but initial statistics is stored at the open-access portals of Central Statistical Bureau and State Treasury of Latvia	Data is stored as <b>textual files</b> (PDF or DOCX) corresponding to public reports from municipalities	Digitized survey results stored in relational database (CSV file)
Data integration	Data from different statistical sources (Central Statistical Bureau and State Treasury of Latvia) is linked	Reports from municipalities are gathered and stored in a centralized digital repository; metadata fields (e.g., municipality name, year, and region) are added to index and	Survey responses are matched to municipalities using municipality name as an identifier; survey data (e.g., business process maturity levels) is linked to

	<p>using a shared key such as the municipality name; metrics from multiple tables (e.g., economic, demographic, environmental) are combined into a unified tabular structure; units and formats (e.g., GDP in EUR, population density in persons/km<sup>2</sup>) are standardized during further correlation and cluster analysis, but not in the database</p>	<p>cross-reference with statistical and sociological databases; insights from statistics and survey are combined with contextual data from public reports for richer interpretations</p>	<p>economic indicator (income tax per capita) from the statistical database for further data mining</p>
Data access and querying	<p>Data stored in relational databases (MS Excel and CSV files) is accessed directly by authorized users; SQL queries are used to retrieve, filter, or aggregate data; APIs (if available from data providers: Central Statistical Bureau and State Treasury of Latvia) can be</p>	<p>Textual files are stored in a centralized repository, accessible via a file management system or document-sharing platform (e.g., SharePoint or Google Drive); files are indexed using metadata (e.g., municipality name, report year) for easier navigation Querying: keyword searches across documents (e.g., searching for "strategic development" or "financial status");</p>	<p>Authorized personnel can open the survey results in relational database (CSV file) Querying: SQL queries for more complex analysis, such as <code>SELECT * FROM surveys WHERE maturity_level = '4';</code> (to identify municipalities with a specific BPMdl maturity level); combining survey data with statistical</p>

	<p>used for automated data retrieval</p> <p>Querying: SQL commands such as SELECT * FROM municipalities WHERE GDP_per_capita &gt; 10000; (to filter municipalities by GDP); aggregate functions like SUM, AVG, and GROUP BY for statistical analysis</p>	<p>automated queries using text analysis tools to extract specific sections or terms</p>	<p>indicators using IBM SPSS functions</p>
Data processing and analysis	<p>Preliminary calculation (with MS Excel) of per capita variables dividing the total indicators by the number of inhabitants or the number of km<sup>2</sup>; correlation analysis (with IBM SPSS): exploring relationships between variables in order to find strong and statistically significant relationships between economic / environmental indicators of municipalities</p>	<p>Documents' (annual public reports 2023 of Latvian municipalities) SWOT-analysis (in particular, creation of SWOT-matrixes and summaries) using AI tool (ChatGPT 4o) and the following task for it: "Based on the attached Public Report 2023 (in Latvian), conduct a SWOT-analysis to understand the strengths, weaknesses, opportunities and threats for the municipality"</p>	<p>BPMdl maturity level analysis (with IBM SPSS): evaluating the levels of business process maturity across municipalities; data mining (with IBM SPSS) of the survey data using four methods of quantitative data analysis: comparison of means, correlation and regression analysis, discriminant analysis (to identify the relationships between BPMdl maturity levels and the level of local economic development in</p>

	and their [indicators] potential factors (to be included in further cluster analysis); cluster analysis (with IBM SPSS): grouping municipalities based on potential factors (identified within preliminary correlation analysis) of economic / environmental indicators		Latvian municipalities)
Data security and privacy	Data stored in relational databases (MS Excel and CSV files) at the authors of this study and available by the request; initial statistics is taken from the open-access portals of Central Statistical Bureau and State Treasury of Latvia	Annual public reports of Latvian municipalities are stored in centralized repository with open access;	Data collected via survey tools is encrypted during storage and transmission; personally identifiable information (PII) of respondents is closed to maintain confidentiality; survey participants are informed about the purpose of data collection and their rights to privacy
Outputs and deliverables	Correlation analysis outputs showing relationships between economic / environmental	SWOT-matrix of local territorial development for each Latvian municipality, including its strengths, weaknesses, opportunities and	Outputs of data mining, showing those elements of business process modeling, the level of maturity of which is statistically

	indicators of municipalities and their [indicators] potential factors (to be included in further cluster analysis); cluster analysis results identifying typological groups of Latvian municipalities (the capital, centered and remote cities, centered and remote counties)	threats, as well as the summary of SWOT-analysis; comparative table of two versions of the SWOT-matrixes of local territorial development for Riga City (the capital of Latvia)	significant and quite strongly influences the level of local economic development in Latvian municipalities; deliverables: regression equation and tables with the results of comparison of means, correlation analysis, discriminant analysis
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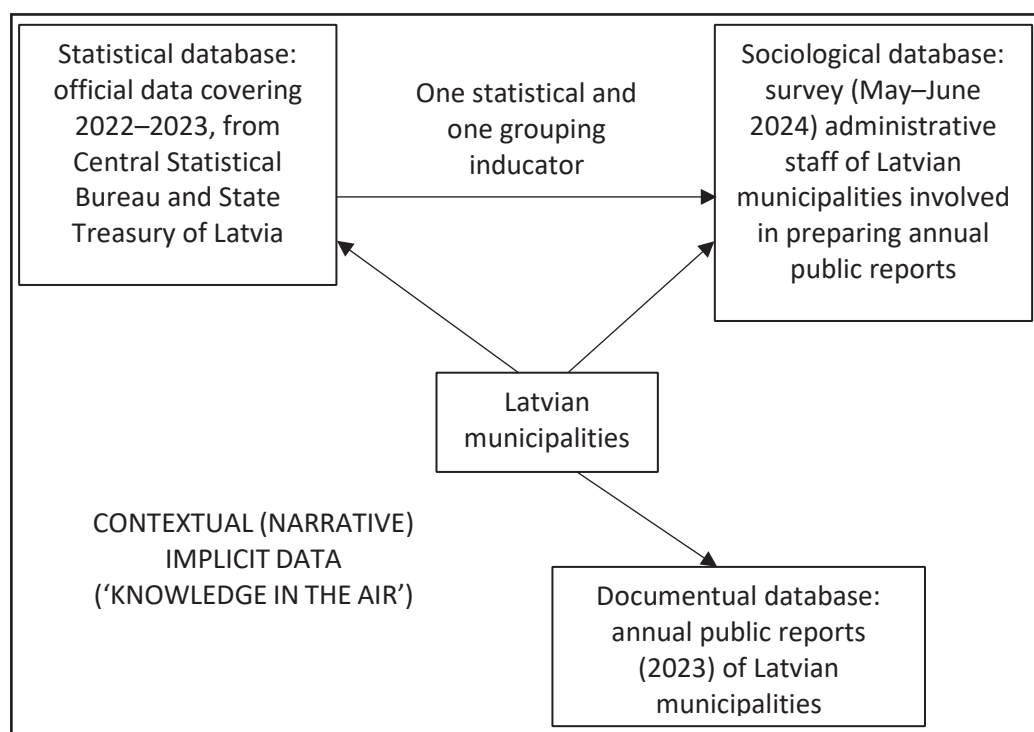
*Source: own elaborated based on Inmon & Linstedt, 2015; Sherman, 2015.*

General system of the data used in this study is an integrated framework combining contextual (narrative) implicit data ('knowledge in the air' – Bell & Albu, 1999) and measurable explicit data ('knowledge in databases' – Matheus et al., 1993) for local territorial development diagnostics. 'Knowledge in the air' represents contextual (narrative) implicit data and qualitative insights, often accessible only to local experts familiar with specific territorial background. This data includes narrative and context-based information reflected in public reports, qualitative surveys, and expert opinions. The study employs methods like discourse analysis and SWOT-analysis (using ChatGPT 4o) to interpret this type of data.

In turn, measurable explicit data ('knowledge in databases') refers to structured, quantifiable data gathered from statistical databases (for example, data on population density, GDP per capita, income tax per capita, road infrastructure metrics, and greenhouse gas emissions), official records (centralized repository of annual public reports of municipalities), and sociological surveys. IBM SPSS is used for quantitative analysis, including comparison of means, correlation, regression, discriminant and cluster analysis.

## Integration and Use

In general, data system emphasizes the synergy between these two types of data. Contextual data provides the narrative needed to situate explicit data within a meaningful framework, enabling deeper diagnostics; explicit data quantifies and validates patterns observed in the contextual data, ensuring statistical rigor and generalizability. The study operationalizes this integration by designing the data system used in the study (Figure 1.5). This approach bridges the conceptual gap between narrative insights and measurable indicators, facilitating a comprehensive diagnostic model tailored for local territorial development



**Fig. 1.5. Data system used in the study: measurable explicit data ('knowledge in databases') in the context of narrative implicit data ('knowledge in the air')**

*Source: own elaborated based on the section's analysis as well as Matheus et al., 1993; Bell & Albu, 1999.*



Thus, data system used in the study underscores that 'knowledge in databases' (Matheus et al., 1993) serves as the backbone for data-based machine diagnostics of local territorial development, offering a quantifiable, objective lens for analyzing complex spatial development issues. It also highlights how combining this data with advanced computational tools and narrative insights fosters sustainable and inclusive territorial development.

In turn, 'knowledge in the air' (Bell & Albu, 1999) refers to tacit, implicit information shaped by the local environment, historical, cultural, and social contexts. It is not always codified in explicit databases. This type of knowledge captures unique local dynamics, such as informal systems, stakeholder relationships, and unspoken cultural norms, crucial for understanding territorial challenges and opportunities. As for Latvian specific 'knowledge in the air', it is based on the fact that Latvia has distinct regions (e.g., Latgale, Kurzeme, Zemgale, Vidzeme), each with its cultural heritage, traditions, and historical influences. 'Knowledge in the air' captures these nuanced differences, which are critical for creating development strategies that resonate with local populations. For example, regions like Latgale are economically and socially distinct, often characterized by lower population density, slower economic growth, and proximity to non-EU borders. In smaller or remote municipalities, much of the decision-making and development depend on informal networks, relationships, and local customs (this knowledge helps identify key stakeholders, informal influencers, and grassroots initiatives that are not apparent in explicit data).

Growing up and living in Latgale, the authors has firsthand experience of the region's cultural, economic, and social fabric. This enables to intuitively grasp unwritten dynamics, such as typologization of Latvian territories. The authors' local connections likely provide access to stakeholders, informal leaders, and community members, fostering richer qualitative insights (these relationships help uncover narratives and patterns that external researchers might overlook). The authors' lived experiences in a remote region (Latgale) allow to empathize with local challenges (e.g., outmigration, lack of infrastructure) and recognize opportunities (e.g., cultural tourism, cross-border trade). Being a local, the authors may gain trust more easily from community members, which is essential for gathering honest, unfiltered insights. Thus, the combination of 'knowledge in the air' and the authors' lived experience in Latgale creates a powerful advantage for understanding and addressing the unique challenges of local territorial development in Latvia. Her intimate connection with the region enables to bridge the gap between implicit

narratives and explicit data, ensuring that development strategies are not only data-driven but also contextually sensitive and locally resonant. The research question is: are artificial intelligence tools (specifically ChatGPT 4o) able to capture this “knowledge in the air” or is it really (as the research hypothesis suggests) beyond the scope of both data science and computer science, but accessible only to experts who are actually physically involved in the context of the issue being analyzed?

## 2. EMPIRICAL STUDY OF LOCAL TERRITORIAL DEVELOPMENT IN LATVIAN MUNICIPALITIES

### 2.1. Context analysis of local territorial development in Latvian municipalities

The context analysis of local territorial development in Latvian municipalities begins with an examination of the correlation between the main potential determinants of the typology of Latvian territories (Fig. 1.3) and their economic productivity / environmental sustainability (Table 2.1). Statistical data about Latvian municipalities for this analysis provided in statistical database (Table 1.4).

Table 2.1

**Correlation between the main potential determinants of the typology of Latvian territories and their economic productivity / environmental sustainability, N = 43, 2022–2023**

Correlating indicators	Variables of correlation analysis	Indicators of economic productivity (in territories)		Indicators of environmental sustainability (in territories)	
		GDP per capita	Income tax per capita	GHG per capita	GHG per km <sup>2</sup>
Share of the electric passenger cars, % of the registered passenger cars	Pearson correlation coefficient	0.400**	0.800**	-.505**	0.134
	Significance (2-tailed)	0.008	<0.001	<0.001	0.392
Share of asphalt and other bituminous surfaces, % of road	Pearson correlation coefficient	0.511**	0.544**	-0.705**	0.679**
	Significance (2-tailed)	<0.001	<0.001	<0.001	<0.001

Roads' density, km of roads per km <sup>2</sup> of area	Pearson correlation coefficient	0.241	0.208	-0.575**	0.856**
	Significance (2-tailed)	0.119	0.180	<0.001	<0.001
Population density, number of inhabitants per km <sup>2</sup> of area	Pearson correlation coefficient	0.427**	0.215	-0.497**	0.969**
	Significance (2-tailed)	0.004	0.167	<0.001	<0.001
Distance to Rīga, km	Pearson correlation coefficient	-0.494**	-0.832**	0.432**	0.001
	Significance (2-tailed)	<0.001	<0.001	0.004	0.993

\*\* Correlation is significant at the level 0.01 (2-tailed).

Source: own elaborated using IBM SPSS software and data from Central Statistical Bureau (Latvia), 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g; State Treasury of Latvia, 2024.

The results of correlation analysis presented in Table 2.1 highlight the relationships between transport and its infrastructure and economic / environmental indicators in Latvian municipalities. Better roads infrastructure and higher share of electric passenger cars are associated with improved economic outcomes and lower GHG per capita emissions. However, increased roads density and population density can lead to higher GHG emissions per unit area, posing challenges for environmental sustainability. Proximity to Riga is crucial for economic productivity and may contribute to higher GHG emissions per capita as the distance increases. In any case, all five correlating indicators show statistically significant relationships with one or another aspect of economic productivity / environmental sustainability in Latvian municipalities and will be included in further cluster analysis.

The results of the cluster agglomeration process showed that the optimal number of clusters, calculated based on fixing the step in the agglomeration process after which the coefficient increases stepwise (in this case, from 8.879 at the 39<sup>th</sup> step to 14.064 at the 40<sup>th</sup> step), is 4 (calculated using IBM SPSS software). The main results of the cluster analysis are presented in the following table.

Table 2.2

**Typological groups of Latvian municipalities obtained  
as a result of cluster analysis, N = 43, 2022–2023**

Parameters	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Cluster name	The capital of Latvia	Centered cities	All Latvian counties	Remote cities
Number of municipalities	1	3	36	3
Names of participants	Rīga	Jelgava, Jūrmala, Ventspils	A group of all 36 Latvian counties that needs further classification	Daugavpils, Liepāja, Rēzekne
Share of the electric passenger cars, %	5.7	7.7		1.4
Share of asphalt and other bituminous surfaces, %	72.3	69.5		69.9
Roads density, km	3.96	3.91		4;88
Population density, persons	2,309	724		1,364
Distance to Rīga, km	0	83		223

*Source: own elaborated using IBM SPSS software and data from Central Statistical Bureau (Latvia), 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g.*

The results of cluster analysis showed in Table 2.2 reveal distinct typological groups among Latvian municipalities. Clusters 1, 2 and 4 show the similar state of transport infrastructure development, whereas remote cities (Cluster 4) faces challenges such as lower electric vehicle adoption and greater distances from the economic center, impacting their economic and environmental profiles (Table 2.3). Remote cities in Latvia have a more ‘industrial’ profiles, with a relatively higher (compared to nearby cities) population density and roads density.

Rīga exhibits the highest economic productivity and income levels, highlighting its central role in Latvian economy. Nearby cities benefit from their proximity to Rīga, showing moderate economic activity, while remote cities have slightly higher GDP per capita but struggle with lower income tax levels (Table 2.3). As for environmental profiles, Rīga’s high economic activity comes at the cost of high per capita and area-specific GHG emissions. Centered cities show the most favorable environmental performance with the lowest GHG

emissions per capita and per km<sup>2</sup>, suggesting a balance between economic activity and environmental sustainability. Remote cities, while less economically active, have significant per capita GHG emissions, highlighting environmental challenges despite lower (compared to Rīga) overall GHG emissions density (Table 2.3). This analysis underscores the economic advantages and environmental challenges faced by different groups of Latvian cities, with Riga’s economic leadership contrasted by its environmental impact and nearby cities demonstrating more balanced profiles.

Table 2.3  
**Economic and environmental profiles of the groups of Latvian cities,  
n = 7, 2022–2023**

Economic and environmental indicators	The capital of Latvia, Rīga	Centered cities (Jelgava, Jūrmala, Ventspils)	Remote cities (Daugavpils, Liepāja, Rēzekne)
GDP per capita, EUR	28,943.00	12,454.67	13,283.67
Income tax per capita, EUR	1,159.68	992.17	645.66
GHG per capita, kg	3,712.09	2,630.55	3,306.92
GHG per km <sup>2</sup> of area, thsd t	7.42	1.71	4.12

Source: own elaborated using IBM SPSS software and data from Central Statistical Bureau (Latvia), 2024b, 2024c; State Treasury of Latvia, 2024.

As for the 36 Latvian counties, a second round of cluster analysis is being carried out specifically for them, excluding 7 city municipalities. The results of the cluster agglomeration process showed that the optimal number of clusters, calculated based on fixing the step in the agglomeration process after which the coefficient increases stepwise (in this case, from 16.864 at the 34<sup>th</sup> step to 43.970 at the 35<sup>th</sup> step), is 2 (calculated using IBM SPSS software). The main results of the cluster analysis are presented in the following table.

Table 2.4

**Typological groups of Latvian counties obtained as a result of cluster analysis, n = 36, 2022–2023**

Parameters	Cluster 1	Cluster 2
Cluster name	Centered counties	Remote counties
Number of municipalities	17	19
Names of participants	Ādaži, Aizkraukle, Bauska, Cēsis, Dobele, Jelgava, Ķekava, Limbaži, Mārupe, Ogre, Olaine, Ropaži, Salaspils, Saulkrasti, Sigulda, Tukums, Valmiera municipalities	Alūksne, Augšdaugava, Balvi, Dienvidkurzeme, Gulbene, Jēkabpils, Krāslava, Kuldīga, Līvāni, Ludza, Madona, Preiļi, Rēzekne, Saldus, Smiltene, Talsi, Valka, Varakļāni, Ventspils municipalities
Share of the electric passenger cars, %	3.8	1.0
Share of asphalt and other bituminous surfaces, %	37.3	24.7
Roads density, km	1.05	0.81
Population density, persons	53	10
Distance to Rīga, km	52	182

*Source: own elaborated using IBM SPSS software and data from Central Statistical Bureau (Latvia), 2024a, 2024d, 2024e, 2024f, 2024g.*

Centered counties are characterized by higher electric vehicle adoption, better-developed transport infrastructure, higher population density and proximity to Riga (Table 2.4). These factors contribute to better economic opportunities, access to services and environmental technologies, making these counties more dynamic and integrated into Latvian overall economic framework. In turn, remote counties have lower adoption of electric vehicles, less developed transport infrastructure, lower population density, and are significantly farther from Riga (Table 2.4). These factors contribute to economic isolation, slower development and reduced access to modern infrastructure and environmental technologies, making them less competitive and more reliant on traditional transportation methods. Overall, the typological groups reflect the urban-rural divide within Latvian counties, with centered counties

benefiting from proximity to urban centers and better infrastructure, while remote counties face challenges related to distance, lower transport infrastructure quality and lower population density.

Table 2.5

**Economic and environmental profiles of the groups of Latvian counties, n = 36, 2022–2023**

Economic and environmental indicators	Centered counties, n = 17	Remote counties, n = 19
GDP per capita, EUR	13,499.24	10,042.32
Income tax per capita, EUR	925.28	586.83
GHG per capita, kg	5,106.35	6,865.78
GHG per km <sup>2</sup> of area, thsd t	0.20	0.07

*Source: own elaborated using IBM SPSS software and data from Central Statistical Bureau (Latvia), 2024b, 2024c, 2024g; State Treasury of Latvia, 2024.*

As the data of Table 2.5 shows, centered counties exhibit better economic performance, with higher GDP per capita and income tax per capita, reflecting more developed economies, better access to markets and higher income levels. Environmentally, these counties manage lower per capita GHG emissions but have higher emissions per km<sup>2</sup> due to concentrated economic activity. Remote counties, on the other hand, face economic challenges with lower GDP per capita and income tax per capita, reflecting their geographic isolation, lower economic activity and reduced access to economic opportunities. Their higher GHG emissions per capita highlight less efficient energy use and greater environmental challenges, although the overall GHG emissions per km<sup>2</sup> are lower due to their vast, sparsely populated areas.

Figure 2.1 visualizes five types of the Latvian territories (obtained as a result of a two-level cluster analysis, for cities and counties), namely:

- (1) Riga, the capital of Latvia and its geographical, logistic, economic, etc. centre of the country (Cluster 1);
- (2) capital-centered cities of Latvia (Ventspils, Yelgava, Yurmala), located close or relatively close to Riga, i.e. in the central areas (with the exception of Ventspils) (Cluster 2);
- (3) remote cities of Latvia (Daugavpils, Liepaya, Rezekne), located far from Riga, i.e. in remote areas (Cluster 3);



- (4) capital-centered counties of Latvia (17 municipalities), located close or relatively close to Riga (Cluster 4);
- (5) remote counties of Latvia (19 municipalities), located far from Riga (Cluster 5).



**Fig. 2.1. Cartographic visualisation of the typology of Latvian municipalities**  
*Source: own elaborated using ArcGIS software and results of cluster analysis.*

Thus, socially, economically and environmentally developed Latvia can be outlined on a geographical map (Figure 3) using a compass, resting its leg on the point representing Riga. About the rest of the country's territory, if it were not for three relatively large industrial cities (Daugavpils, Liepaya, Rēzekne), the political elite of Latvia would most likely prefer to forget completely, since many remote areas of Latvia are impossible to reach by land transport, especially under unfavourable weather conditions and in the off-season (Voronov, 2022; Chmielewski, 2023).

## 2.2. Data-based machine SWOT-analysis of local territorial development in Latvian municipalities

As it was noted in the introduction of the study, the data-based machine SWOT-analysis of local territorial development in Latvian municipalities will be carried out based on the annual public reports 2023 of municipalities. Annual public reports of Latvian municipalities are comprehensive documents that provide detailed information about the municipality's activities, financial status, strategic developments and community engagement over the past year. These reports are essential for ensuring transparency, accountability and informing the society about the municipality's performance and future plans (Cabinet of Ministers (Latvia), 2010). According to the Regulations No. 413 "On annual public reports" issued by the Cabinet of Ministers (Latvia) in 2010, the general structure of these reports must include:

- (1) Introduction: overview of the municipality's mission, vision, and strategic goals;
- (2) Financial Summary: detailed financial statements including revenue, expenditures and budget allocations;
- (3) Key Achievements: highlights of major projects, initiatives, and accomplishments over the past year;
- (4) Performance Metrics: analysis of key performance indicators and metrics that measure the municipality's effectiveness and efficiency;
- (5) Public Participation: information on public involvement in municipal decision-making processes;
- (6) Future Plans: strategic plans and objectives for the upcoming year;
- (7) **Compliance and Governance**: details on compliance with regulations, governance practices and internal controls;
- (8) Additional Sections: any other relevant sections specific to the municipality's unique activities or challenges.

Five Latvian municipalities (one from each typical cluster of Latvian territories) were selected for further SWOT-analysis of the annual public reports of municipalities, carried out using AI tool and its standard methods of extracting and summarising key points from the analysed document. According to the research methodology, the task for AI tool (ChatGPT 4o) is the following (Table 1.1): "Based on the attached Public Report 2023 (in Latvian), conduct a SWOT analysis to understand the strengths, weaknesses, opportunities and threats for the municipality". SWOT-matrixes for all 43 Latvian municipalities presented in Annex.

Table 2.6

**SWOT-matrix of local territorial development for Riga City  
(the capital of Latvia, Cluster 1), 2023**

Strengths	Weaknesses
<p>1. <b>Economic Stability:</b> Riga experienced a steady increase in budget revenue, particularly from income and property taxes. The city's budgetary income in 2023 exceeded expectations by €123.7 million, demonstrating a strong fiscal position.</p> <p>2. <b>Tourism and Transport Hub:</b> Riga is a key destination for tourism, with a growing number of visitors. The city has a well-developed public transportation network, including trams, trolleybuses, and buses, along with an important seaport and proximity to Riga International Airport, which boosts the local economy.</p> <p>3. <b>Educational Investments:</b> Significant resources are allocated to education, with €468.4 million (36% of the budget) directed towards educational development, ensuring quality and modernised facilities.</p> <p>4. <b>Strategic Infrastructure Projects:</b> Riga has successfully implemented significant infrastructure projects, including road and transport upgrades, supported by EU funds. This includes projects like the Salu Bridge's reconstruction and the Eastern Highway's development.</p>	<p>1. <b>Ageing Infrastructure:</b> Some sectors, like public transport and urban infrastructure, still require significant upgrades. Persistent delays in construction and high costs hinder swift progress.</p> <p>2. <b>Demographic Challenges:</b> The city's population has been declining since 2017, with a slight decrease in 2023 despite temporary growth due to migration from Ukraine.</p> <p>3. <b>Traffic and Congestion:</b> Traffic congestion remains an issue in urban areas, requiring continuous investment and planning to improve mobility and reduce delays.</p> <p>4. <b>Economic Disparities:</b> There is a noticeable income gap between the public and private sectors, with wages in the private sector trailing behind the public sector, potentially affecting employment dynamics.</p>

Opportunities	Threats
<p><b>1. EU Funding for Urban Development:</b> The availability of EU funds offers opportunities for sustainable urban development, including green energy projects and public space revitalisation.</p> <p><b>2. Tourism Growth:</b> Increasing tourist numbers, especially from foreign countries, present opportunities for economic growth through the hospitality and service sectors.</p> <p><b>3. Digital and Green Transition:</b> Initiatives in digitalisation and green energy can position Riga as a leading city in innovation, attracting businesses and reducing environmental impact.</p> <p><b>4. Business and Investment:</b> Establishing business-friendly environments and infrastructure development can attract more foreign investment, fostering economic diversification.</p>	<p><b>1. Global Economic Instability:</b> Economic fluctuations and global crises could impact tourism and investment, potentially affecting local revenue and business growth.</p> <p><b>2. Environmental Risks:</b> Climate change and rising sea levels pose risks to Riga's coastal areas, requiring investments in coastal protection and adaptation strategies.</p> <p><b>3. Construction and Material Costs:</b> High costs of construction materials and a shortage of skilled labourers may delay or limit the scope of essential urban development projects.</p> <p><b>4. Dependence on Traditional Sectors:</b> Reliance on established sectors like trade and transport can make the economy vulnerable to industry-specific downturns or technological shifts.</p>

*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024.*

This SWOT-analysis illustrates Riga's strengths in economic stability, education, and infrastructure while highlighting the challenges of ageing infrastructure, demographic decline, and the need for economic diversification (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024).

Analysing Public Report 2023 of Riga City Municipality, AI tool (ChatGPT 4o) adequately and based on the data obtained assessed the strengths of **Riga City** (economic stability, tourism and transport hub, educational investments, strategic infrastructure projects), its weaknesses (ageing infrastructure, demographic challenges, traffic and congestion, economic disparities), **opportunities** (EU funding for urban development, tourism growth, digital and green transition, business and investment), and **threats** (global economic instability, environmental risks, construction and material costs, dependence on traditional sectors) (Table 2.6). According to the authors, this means that AI

tools must be actively used in the process of diagnosing local territorial development, as well as in the process of planning it.

The following two tables present SWOT-matrixes for two Latvian cities: the capital-centred Yelgava City (Cluster 2) and remote Liepaja City (Cluster 3), located in the Kurzeme region of Latvia, near the shore of the Baltic Sea.

Table 2.7

**SWOT-matrix of local territorial development for Yelgava City  
(the capital-centered city of Latvia, Cluster 2), 2023**

Strengths	Weaknesses
<p><b>1. Industrial Growth:</b> Jelgava has a robust industrial sector with notable strengths in metalworking, mechanical engineering, woodworking, and food production. The processing industry contributes significantly to economic growth, with a high export share (75.7% in 2023).</p> <p><b>2. Educational Investments:</b> The city prioritises education, as seen in opening a new engineering-focused high school and modernised kindergartens, aiming to provide a contemporary learning environment.</p> <p><b>3. Public Infrastructure Development:</b> Ongoing infrastructure projects, such as road upgrades, water tourism facilities, and social service centres, enhance urban development and quality of life.</p> <p><b>4. Strategic Location:</b> Jelgava's location near Riga facilitates access to a larger job market and economic opportunities, making it an attractive place for residents and businesses.</p>	<p><b>1. Ageing Population:</b> The demographic trend shows a declining and ageing population, which increases the demographic burden and affects the availability of a skilled workforce.</p> <p><b>2. Economic Dependence on Traditional Industries:</b> While industrial sectors are strong, there is a reliance on traditional industries, which may limit diversification and innovation in the economy.</p> <p><b>3. Low Wage Growth:</b> Jelgava's wage increase was the slowest among other major cities, leading many qualified professionals to seek employment in Riga for better salaries.</p> <p><b>4. Infrastructure and Construction Challenges:</b> The city faces delays in infrastructure projects due to high construction costs and a lack of skilled workers.</p>

Opportunities	Threats
<p><b>1. Expansion of Tourism and Cultural Projects:</b> Jelgava can leverage its cultural and historical heritage to attract more tourists, enhancing its visibility and economy through events and infrastructure projects.</p> <p><b>2. Renewable Energy Initiatives:</b> Investments in clean and sustainable energy, such as infrastructure projects aligned with EU sustainability goals, offer a path for economic and environmental benefits.</p> <p><b>3. EU and State Funding:</b> Access to EU and state funds for public projects and infrastructure improvements presents opportunities to modernise the city's infrastructure and services.</p> <p><b>4. Development of Industrial Parks:</b> The creation of the Zemgale Industrial Park aims to revitalise degraded areas and attract private investments, promoting economic development.</p>	<p><b>1. Demographic Decline:</b> A shrinking population with a growing number of elderly residents could strain social services and impact the city's long-term sustainability.</p> <p><b>2. Economic Vulnerability:</b> Dependency on traditional industrial sectors makes the city susceptible to global market fluctuations, impacting local businesses.</p> <p><b>3. Environmental Challenges:</b> As an industrial hub, Jelgava must address environmental concerns to maintain sustainable growth, especially in sectors like manufacturing and energy.</p> <p><b>4. Competition from Riga:</b> Proximity to Riga, while advantageous, also means competing for talent and businesses, as the capital city offers higher wages and more diverse job opportunities.</p>

*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Yelgava City (Latvia), 2024.*

This SWOT analysis highlights Jelgava’s strengths in industrial capacity and educational investment while acknowledging challenges related to demographics and economic diversification (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Yelgava City (Latvia), 2024).

According to the authors, the AI tool (ChatGPT 4o) also adequately and based on the data obtained, assessed the strengths of Yelgava City, its weaknesses, opportunities, and threats (**Table 3**). Although new for Latvian research (Arhipova & Paula, 2015; Voronov & Ruza, 2018; Grytten et al., 2024) is the fact that **AI tool identified proximity to Riga of Yelgava City** as a threat rather than an opportunity for local territorial development: “Proximity to Riga, while advantageous, also means competing for talent and businesses, as the capital city offers higher wages and more diverse job opportunities” (4<sup>th</sup> threat, Table 2.7).

Table 2.8

**SWOT-matrix of local territorial development for Liepaya City  
(the remote city of Latvia, Cluster 3), 2023**

Strengths	Weaknesses
<p><b>1. Industrial and Economic Growth:</b> Liepāja is the second-largest manufacturing city in Latvia, with a well-established industrial sector that includes metalworking, machinery, textiles, and construction. The city has seen a notable increase in manufacturing output over the past five years.</p> <p><b>2. Tourism and Culture:</b> The city is a significant cultural centre with strong tourism potential, attracting visitors with its cultural events, historical sites, and coastal attractions. The construction of new cultural facilities, like the "Liedags" kindergarten, highlights ongoing investment in local infrastructure.</p> <p><b>3. Port and Transport Infrastructure:</b> Liepāja has a strategic port that supports logistics and international trade alongside well-developed transport infrastructure. This includes enhancements in public transportation and road networks.</p> <p><b>4. Educational Investments:</b> The city has prioritised educational improvements, with modernised schools, kindergartens, and investment in professional training institutions that cater to local industry needs.</p>	<p><b>1. Demographic Challenges:</b> Liepāja faces a declining and ageing population, which impacts the local labour force and poses challenges for long-term economic sustainability.</p> <p><b>2. Unemployment Issues:</b> The city has a relatively high unemployment rate, particularly among youth and long-term unemployed groups, which may indicate a skills mismatch in the local economy.</p> <p><b>3. Economic Dependence on Traditional Industries:</b> The economy heavily relies on traditional sectors like manufacturing and construction, with limited diversification into high-tech or innovative sectors.</p> <p><b>4. Infrastructure Maintenance:</b> While there is investment in new infrastructure, the maintenance and modernisation of existing facilities, especially in older parts of the city, remain challenging.</p>

Opportunities	Threats
<p><b>1. Green and Sustainable Development:</b> There are opportunities for Liepāja to invest in green energy and sustainable infrastructure aligned with EU funding and sustainability goals. This includes initiatives in renewable energy and waste management.</p> <p><b>2. Tourism Expansion:</b> Enhancing tourism through cultural events, coastal development, and improved facilities can drive economic growth, leveraging the city's cultural and natural assets.</p> <p><b>3. Foreign Investment and Industrial Parks:</b> Developing industrial parks and attracting foreign investments can boost the local economy, creating more jobs and diversifying the economy.</p> <p><b>4. Cross-Border Cooperation:</b> Liepāja's geographical position facilitates cooperation with neighbouring countries, enhancing trade, cultural exchange, and joint projects.</p>	<p><b>1. Global Economic Volatility:</b> The city's reliance on manufacturing and exports makes it vulnerable to global economic shifts, particularly fluctuations in demand and supply chains.</p> <p><b>2. Environmental Risks:</b> As a coastal city, Liepāja faces risks from climate change, such as rising sea levels and extreme weather events, which could impact its port and tourism sectors.</p> <p><b>3. Competition from Other Cities:</b> Liepāja faces competition from other Latvian and Baltic cities for tourism, investment, and skilled labour, which could limit its growth potential.</p> <p><b>4. Long-Term Demographic Trends:</b> The ageing population and declining birth rates present a long-term challenge for sustaining a productive workforce and maintaining economic vitality.</p>

*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Liepaja City (Latvia), 2024.*

This SWOT-analysis underscores Liepāja’s strengths in industry and cultural appeal while acknowledging the demographic and economic challenges that require strategic planning for sustainable development (elaborated by AI tool (ChatGPT 4o) based on the Municipal Council of Liepaya City (Latvia), 2024). According to the authors, the AI tool (ChatGPT 4o) also adequately assessed the strengths of Liepaya City, its weaknesses, **opportunities**, and **threats** based on the data obtained (Table 2.8). The following two tables present SWOT-matrixes for two Latvian counties: the capital-centred Ropazhi County (Cluster 4) and remote Augshdaugava County (Cluster 5), located in the Latgale region of Latvia, near the border with Belarus.



Table 2.9

**SWOT-matrix of local territorial development for Ropazhi County  
(the capital-centered county of Latvia, Cluster 4), 2023**

Strengths	Weaknesses
<p><b>1. Population Growth and Engagement:</b> Ropaži experienced strong population growth, particularly in the Stopiņi and Garkalne areas, driven by residential attractiveness and low unemployment. Community engagement is encouraged through each district's participatory budgeting and active consultative councils.</p> <p><b>2. Economic Diversity and Business Support:</b> The municipality supports a range of industries, including large and small enterprises, with a solid foundation in trade, processing, and construction. Support programs, such as grants and tax relief, foster local businesses.</p> <p><b>3. Investment in Education and Infrastructure:</b> Ropaži allocates a substantial portion of its budget to education and infrastructure, reflected in recent improvements to schools, sports facilities, and public utilities.</p> <p><b>4. Commitment to Sustainability:</b> Initiatives in renewable energy, such as solar power facilities and environmental projects, support the municipality's sustainable development goals.</p>	<p><b>1. Dependence on Surrounding Areas:</b> The municipality relies on proximity to Riga and neighbouring municipalities for economic opportunities and employment, which may impact self-sufficiency.</p> <p><b>2. Budgetary Constraints:</b> Limited financial resources restrict the municipality's ability to expand services or fully maintain infrastructure, especially as the population grows.</p> <p><b>3. Aging Infrastructure in Rural Areas:</b> While urban centres receive improvements, maintaining and upgrading infrastructure in rural parts remains challenging.</p> <p><b>4. Demographic Challenges:</b> Although population growth is robust, the municipality faces long-term issues related to an ageing demographic, which could impact workforce availability and demand for social services.</p>

Opportunities	Threats
<p><b>1. Enhanced Regional and International Collaboration:</b> Positioned near Riga, Ropaži has opportunities for partnerships on public services, tourism, and economic projects, including collaborations with international partners like Ukraine.</p> <p><b>2. Development of Green and Sustainable Infrastructure:</b> Ropaži has the potential for more eco-friendly projects, including green energy and sustainable urban planning, which aligns with available EU funding.</p> <p><b>3. Growth in Tourism and Cultural Initiatives:</b> Cultural and recreational projects like the Green Road initiative increase tourism and create new local business opportunities.</p> <p><b>4. Digitalisation and Public Service Improvement:</b> Investment in digital services can streamline public administration and increase accessibility for residents.</p>	<p><b>1. Environmental and Climate Risks:</b> As a geographically diverse municipality, Ropaži faces potential environmental risks, such as flooding, that could impact infrastructure.</p> <p><b>2. Economic Dependence on Key Industries:</b> Reliance on specific industries, like trade and construction, exposes the municipality to market fluctuations.</p> <p><b>3. Competition for Talent and Resources:</b> Ropaži competes with Riga and other regions for skilled labour and investment, which may limit local growth and economic diversification.</p> <p><b>4. Infrastructure Demand and Population Growth:</b> The rapid population increase places pressure on public services and infrastructure, requiring continuous investment that may strain the budget.</p>

*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Ropazhi County (Latvia), 2024.*

This SWOT-analysis captures Ropaži's strengths in community growth, economic support, and sustainability while noting challenges related to budget constraints and infrastructure demands amidst population growth (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Ropazhi County (Latvia), 2024).

As in the case of the capital-centred Yelgava City, AI tool identified proximity to Riga of Ropazhi County as a threat rather than an opportunity for local territorial development: "Ropaži competes with Riga and other regions for skilled labour and investment, which may limit local growth and economic diversification" (3<sup>rd</sup> threat, Table 2.9).

Table 2.10

**SWOT-matrix of local territorial development for Augšdaugava County  
(the remote county of Latvia, Cluster 5), 2023**

Strengths	Weaknesses
<p><b>1. Diverse Economy:</b> Augšdaugava's economy includes a wide range of industries, such as agriculture (especially mixed farming and grain production), retail, and transportation services like taxi and freight.</p> <p><b>2. Investment in Public Infrastructure:</b> The municipality has been actively implementing EU-funded investment projects, including energy efficiency measures, such as in public lighting and the renovation of public buildings.</p> <p><b>3. Collaboration with Neighboring Regions:</b> The municipality maintains strong cross-border cooperation with regions in Lithuania, Poland, and Georgia, which fosters opportunities for joint projects and resource sharing.</p> <p><b>4. Support for Small and Medium-Sized Enterprises (SMEs):</b> A relatively high number of registered businesses exist in the region, showing entrepreneurial activity and local economic participation.</p>	<p><b>1. Declining Population:</b> There is a significant demographic challenge, with the number of deaths far exceeding births (97 births vs 525 deaths in 2023), leading to a shrinking and ageing population.</p> <p><b>2. High Unemployment:</b> While the unemployment rate in Augšdaugava is 7.7%, it remains higher than the national average (5.7%), and long-term unemployment affects a substantial part of the population.</p> <p><b>3. Dependence on Traditional Industries:</b> The economy heavily relies on agriculture and retail, which may limit growth in high-tech and knowledge-based industries.</p> <p><b>4. Infrastructure Challenges in Education and Social Services:</b> Some schools and social housing require modernisation, with several housing units reported as unsuitable for living without significant repair.</p>
Opportunities	Threats
<p><b>1. EU Funding for Sustainable Development:</b> The municipality can continue to leverage EU structural funds to improve energy efficiency, modernise infrastructure, and support local industries. For example, improving public lighting and upgrading public buildings will help reduce energy consumption and emissions.</p> <p><b>2. Tourism Potential:</b> The restoration and promotion of cultural and natural</p>	<p><b>1. Demographic Decline:</b> With more deaths than births and significant long-term unemployment, the workforce is shrinking, which may pose challenges for sustaining economic growth.</p> <p><b>2. Limited Diversification in Industry:</b> The heavy reliance on agriculture and retail makes the local economy vulnerable to external shocks in these sectors.</p>

<p>heritage sites, such as “Latgales sēta” and Slutišķi 2, can enhance local tourism and economic growth.</p> <p><b>3. Investment in Social Services:</b> The municipality is implementing infrastructure improvements for social services, which can increase the quality of life, such as providing housing and care for vulnerable groups.</p> <p><b>4; Green Transition:</b> Investments in clean energy, like solar panel installations and electric vehicle infrastructure, offer opportunities for sustainable development.</p>	<p><b>3. Regional Disparities:</b> The rural nature of many parts of Augšdaugava could hinder access to services, education, and employment opportunities compared to more urbanised areas.</p> <p><b>4. Environmental Risks:</b> Projects aimed at cleaning historically polluted sites (like Višķu mazuta glabātava) indicate a potential environmental risk that, if not correctly managed, could harm local health and development</p>
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*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Augshdaugava County (Latvia), 2024.*

This SWOT-analysis highlights the municipality’s strengths in infrastructure and partnerships, but also the challenges posed by demographic trends and economic dependence on traditional sectors (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Augshdaugava County (Latvia), 2024).

Thus, AI tool (ChatGPT 4o) demonstrates a strong and even original (critical attitude towards proximity to Riga as a stimulus of local territorial development) ability for SWOT analysis of annual public reports of Latvian municipalities, while also maintaining the context of local territorial development, i.e. type of Latvian territories, which is reflected in the analysed documents.

The authors also tried an experiment by asking AI tool (ChatGPT 4o) to conduct a SWOT analysis again for Riga City based on the same data (Municipal Council of Riga City (Latvia), 2024), but within separate communication sessions. The following table compares two versions of the SWOT matrixes for Riga City.

Table 2.11

**Comparison of two versions of the SWOT-matrixes of local territorial development for Riga City (the capital of Latvia, Cluster 1), 2023**

1 <sup>st</sup> version (first communication session)	2 <sup>nd</sup> version (second communication session)
Strengths	Strengths
<p>1. <b>Economic Stability:</b> Riga experienced a steady increase in budget revenue, particularly from income and property taxes. The city's budgetary income in 2023 exceeded expectations by €123.7 million, demonstrating a strong fiscal position.</p> <p>2. <b>Tourism and Transport Hub:</b> Riga is a key destination for tourism, with a growing number of visitors. The city has a well-developed public transportation network, including trams, trolleybuses, and buses, along with an important seaport and proximity to Riga International Airport, which boosts the local economy.</p> <p>3. <b>Educational Investments:</b> Significant resources are allocated to education, with €468.4 million (36% of the budget) directed towards educational development, ensuring quality and modernised facilities.</p> <p>4. <b>Strategic Infrastructure Projects:</b> Riga has successfully implemented major infrastructure projects, including road and transport upgrades, supported by EU funds. This includes projects like the Salu Bridge's reconstruction and the Eastern Highway's development.</p>	<p>1. Financial Stability: The municipality showed financial growth, with increased tax revenues such as the personal income tax and property tax, surpassing planned expectations.</p> <p>2. Infrastructure Investment: Significant capital investments in infrastructure, particularly in transportation, have been made to improve the city's quality of life.</p> <p>3. Effective Debt Management: The municipality maintained a manageable debt level, adhering to financial strategies that allow continued investments in city development.</p> <p>4. Positive Credit Rating: An "A" level credit rating with a stable outlook supports investor confidence and indicates financial soundness.</p>
Weaknesses	Weaknesses
<p>1. <b>Ageing Infrastructure:</b> Some sectors, like public transport and urban infrastructure, still require significant upgrades. Persistent delays in</p>	<p>1. Declining Population: A steady decrease in population over recent years poses challenges in maintaining a sustainable tax base and workforce.</p>

<p>construction and high costs hinder swift progress.</p> <p><b>2. Demographic Challenges:</b> The city's population has been declining since 2017, with a slight decrease in 2023 despite temporary growth due to migration from Ukraine.</p> <p><b>3. Traffic and Congestion:</b> Traffic congestion remains an issue in urban areas, requiring continuous investment and planning to improve mobility and reduce delays.</p> <p><b>4. Economic Disparities:</b> There is a noticeable income gap between the public and private sectors, with wages in the private sector trailing behind the public sector, potentially affecting employment dynamics.</p>	<p><b>2. Budget Deficit:</b> Although reduced, a budget deficit still exists, which could affect future investments if not adequately managed.</p> <p><b>3. Limited Sectoral Development:</b> Some economic sectors, like industrial manufacturing, have a lower contribution than others, suggesting a need for diversification.</p> <p><b>4. Dependence on EU Funds:</b> Heavy reliance on European Union funds for infrastructure projects could pose a risk if future funding decreases.</p>
Opportunities	Opportunities
<p><b>1. EU Funding for Urban Development:</b> The availability of EU funds offers opportunities for sustainable urban development, including green energy projects and public space revitalisation.</p> <p><b>2. Tourism Growth:</b> Increasing tourist numbers, especially from foreign countries, present opportunities for economic growth through the hospitality and service sectors.</p> <p><b>3. Digital and Green Transition:</b> Initiatives in digitalisation and green energy can position Riga as a leading city in innovation, attracting businesses and reducing environmental impact.</p> <p><b>4. Business and Investment:</b> Establishing business-friendly environments and infrastructure development can attract more foreign investment, fostering economic diversification.</p>	<p><b>1. Urban Development:</b> Planned infrastructure projects, including transport improvements and real estate developments, present opportunities for urban growth and increased economic activity.</p> <p><b>2. EU and International Funding:</b> The availability of EU funds and other international investments can boost city development, especially in green and sustainable initiatives.</p> <p><b>3. Increasing Tourism:</b> A rebound in tourism, focusing on attracting more international visitors, can revitalise the hospitality sector and related industries.</p> <p><b>4. Public Transport Improvements:</b> Investments in public transportation and mobility reforms can increase accessibility and reduce traffic congestion.</p>

Threats	Threats
<p><b>1. Global Economic Instability:</b> Economic fluctuations and global crises could impact tourism and investment, potentially affecting local revenue and business growth.</p> <p><b>2. Environmental Risks:</b> Climate change and rising sea levels pose risks to Riga's coastal areas, requiring investments in coastal protection and adaptation strategies.</p> <p><b>3. Construction and Material Costs:</b> High costs of construction materials and a shortage of skilled labourers may delay or limit the scope of essential urban development projects.</p> <p><b>4. Dependence on Traditional Sectors:</b> Reliance on established sectors like trade and transport can make the economy vulnerable to industry-specific downturns or technological shifts.</p>	<p>1. Economic Fluctuations: Global and regional economic instability could impact tax revenues and financial health, leading to potential budget constraints.</p> <p>2. Inflation and Wage Pressure: Rising wage demands and inflation could increase the cost of public services, impacting budget planning.</p> <p>3. Aging Infrastructure: Persistent needs for infrastructure renewal, particularly in transport, require constant funding, and delays could worsen the city's condition.</p> <p>4. Environmental and Climate Risks: As with many urban areas, Riga faces challenges related to climate change, requiring significant investments in green infrastructure.</p>
Summary	Summary
<p>This SWOT analysis illustrates Riga's strengths in economic stability, education, and infrastructure while highlighting the challenges of ageing infrastructure, demographic decline, and the need for economic diversification.</p>	<p>This SWOT analysis highlights the key factors influencing Riga's municipal strategy and planning for future development.</p>

*Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024.*

Recognising the general similarity of the two versions (two different communication sessions) of the obtained SWOT-matrixes for the Riga City (Table 2.11), the authors would prefer to use the first version and reject the second for the following reasons:

- (1) In the second version, the strengths are focused exclusively on financial aspects;

- (2) The ageing infrastructure is not a threat, as suggested in the second version, but rather an internal weakness of Riga City, as presented in the first version;
- (3) The summary of the second version does not contain any specific details for Riga City.

In further analysis of the experiment's results, the authors tried to understand why two different SWOT analysis summaries (Table 2;11) emerged from the same data and the same question to AI tool. The authors' next question to ChatGPT 4o was the following: "Have you applied different techniques or methods for their creation?" The first version's answer: "The two summaries provided for the SWOT analysis of Riga are not based on fundamentally different techniques or methods; rather, the differences arise from a variation in **focus and language used** when generating the summaries" (ChatGPT 4o). The second version's answer: "The two summaries you've mentioned reflect slight variations in emphasis and interpretation, even though they are based on the same document and question" (ChatGPT 4o). The key phrases in both answers are 'variation in focus' and 'variation in emphasis'.

Therefore, the next question for the first version was: "Do you decide this focus yourself?" and for the second one: "Do you decide this emphasis yourself?" The first version's answer: "Yes, the decision to focus on specific elements within a summary is made by me, but it is not random; it is influenced by both technical and non-technical factors" (ChatGPT 4o). The second version's answer: "The emphasis in the summaries is not random. It is based on a combination of technical and non-technical factors" (ChatGPT 4o). The last authors' question for both versions of the communication with AI tool was: Can you change your focus or emphasis within one separate conversation? The first version's answer: "No, I don't independently change my focus or emphasis within a single conversation unless prompted by changes in your question, context, or specific preferences" (ChatGPT 4o). The second version's answer: "No, I won't change my focus or emphasis within a single conversation on my own unless you provide new input or specify a shift" (ChatGPT 4o).

According to the authors, the results of this experiment showed that AI tool can choose a different focus / emphasis for the data-based diagnostics of local territorial development. However, this will remain the same focus / emphasis within a single communication session. This means that the human analyst can select the most correct and relevant focus / emphasis and continue the diagnostics process within the chosen (among provided by AI tool) focus / emphasis.



### **2.3. Data-based machine diagnostics of local territorial development as a modelable business process in Latvian municipalities**

Data of sociological survey collected from administrative staff responsible for the creation of annual public reports in Latvian municipalities or actively involved in this process (n = 43, May–June 2024), is based on the methodology of evaluating business process modeling (BPMdl) in the context of business process management (BPMng) (Table 1.3). The maturity levels scale with a description was sent to respondents and was further explained by the authors during interviews with them. They then subjectively (based on a review of the existing process documentation, governance structures, training programs and IT tools (Lee et al., 2007)) evaluated the maturity level of BPMdl in their municipalities in relation to each of the core elements of BPMng (strategic alignment, governance, methods, information technology, people and culture) on a maturity levels scale from 1 (initial) to 5 (optimizing) (Table 1.3).

To obtain more stable results, data mining of the survey data (Table 1.6) was implemented using four methods of quantitative data analysis: comparison of means (to test the statistical significance of the difference in BPMdl maturity levels between two groups of Latvian municipalities), correlation and regression analysis (to identify the relationships between BPMdl maturity levels and the level of local economic development in Latvian municipalities), discriminant analysis (to find those ‘discriminating’ BPMdl factors and their ‘discriminant power’ that determine the level of local economic development in Latvian municipalities).

In the following table, the means of BPMdl maturity levels in relation to the core elements of BPMng and the results of its comparison between groups of Latvian municipalities with different levels of local economic development are presented.

Table 2.12

**Means of business process modeling (BPMdl) maturity levels in relation to the core elements of business process management (BPMng) in Latvian municipalities, scale from 1 to 5,\* 2024**

BPMdl maturity levels in relation to the core elements of BPMng**	The entire set of Latvian municipalities, N = 43***	Latvian municipalities with a less developed economy, n = 26****	Latvian municipalities with a more developed economy, n = 17	Statistical significance of difference, p*****
Strategic alignment	3.86	3.77	4.00	0.289 (statistically insignificant difference)
Governance	3.05	2.85	3.35	0.041 (statistically significant difference)
Methods	1.91	1.42	2.65	<0.001 (statistically significant difference)
Information technology	3.33	3.23	3.47	0.207 (statistically insignificant difference)
People	2.23	1.69	3.06	<0.001 (statistically significant difference)
Culture	2.07	1.35	3.18	<0.001 (statistically significant difference))

\* BPMdl maturity levels scale:

1 (initialed) – processes are unstructured and unpredictable, success depends on individual effort and heroics;

2 (managed) – processes are defined and documented but might not be standardized, practices are repeatable;

3 (defined) – processes are standardized, documented and communicated across the organization, there are established standards and guidelines;

4 (quantitatively managed) – processes are measured and controlled, there is a focus on quantitative performance management;

5 (optimizing) – continuous process improvement is enabled by quantitative feedback and innovative ideas.

\*\* Strategic alignment – ensures processes align with organizational strategy;

Governance – establishes accountability and decision-making structures;

Methods – tools and techniques supporting BPMdl activities;

Information technology – IT solutions supporting process activities;

People – skills and knowledge of individuals managing processes;

Culture – process-related collective values and beliefs.

\*\*\* The estimates were provided by the administrative staff responsible for creating the annual public reports of Latvian municipalities or actively involved in this process.

\*\*\*\* The municipality with a less developed economy has the average annual income tax per capita below the mean; the municipality with a more developed economy has the average annual income tax per capita above the mean (Komarova et al. 2024).

\*\*\*\*\* To identify the statistical significance of difference in BPMdl maturity levels in relation to the core elements of BPMng, independent sample means were compared with a t-criterion for means equity (2-tailed significance).

*Source: own calculated using IBM SPSS software and survey data from Annex 3.*

The means of BPMdl maturity levels in relation to the core elements of BPMng presented in Table 2.12 demonstrate a moderate overall level of BPMdl maturity (from 1.91 score for methods to 3.86 score for strategic alignment) in Latvian municipalities. However, municipalities with a more developed economy have significantly higher BPMdl scores in relation to the four elements of BPMng: governance, methods, people and culture. In turn, processes' alignment with organizational strategy (strategic alignment) and IT solutions supporting process activities (information technology), respectively, have quantitatively managed and defined maturity levels (3–4 score) in both groups of Latvian municipalities. It means that declaratively in strategies and in terms of IT infrastructure, BPMdl is equally developed in Latvian municipalities with different levels of local economic development, but BPMdl governance, methods supporting BPMdl activities, skills and knowledge of people, as well as process-related culture have statistically significant differences between municipalities with a less developed economy and municipalities with a more developed economy.

Table 2.13

**Correlation between business process modeling (BPMdl) maturity levels and the level of local economic development in Latvian municipalities, N = 43, Kendall coefficient, \* 2024**

BPMdl maturity levels in relation to the core elements of BPMng**	Level of local economic development, 1 or 2***	Statistical significance of difference, p
Strategic alignment, 1–5***	0.158	0.283 (statistically insignificant correlation)
Governance, 1–5	0.319 (correlation is significant with 95% probability)	0.028 (statistically significant correlation)
Methods, 1–5	0.670 (correlation is significant with 99% probability)	<0.001 (statistically significant correlation)
Information technology, 1–5	0.152	0.307 (statistically insignificant correlation)
People, 1–5	0.560 (correlation is significant with 99% probability)	<0.001 (statistically significant correlation)
Culture, 1–5	0.793 (correlation is significant with 99% probability)	<0.001 (statistically significant correlation)

\* The Kendall coefficient for calculating the correlation was chosen due to the dichotomous variable of the level of local economic development (**Sweet, Grace-Martin 2012**) .

\*\* Strategic alignment – ensures processes align with organizational strategy;

Governance – establishes accountability and decision-making structures;

Methods – tools and techniques supporting BPMdl activities;

Information technology – IT solutions supporting process activities;

People – skills and knowledge of individuals managing processes;

Culture – process-related collective values and beliefs.

\*\*\* 1 – less developed municipality (has the average annual income tax per capita below the mean); 2 – more developed municipality (has the average annual income tax per capita above the mean).

\*\*\*\* BPMdl maturity levels scale:

1 (initiales) – processes are unstructured and unpredictable, success depends on individual effort and heroics;

- 2 (managed) – processes are defined and documented but might not be standardized, practices are repeatable;
- 3 (defined) – processes are standardized, documented and communicated across the organization, there are established standards and guidelines;
- 4 (quantitatively managed) – processes are measured and controlled, there is a focus on quantitative performance management;
- 5 (optimizing) – continuous process improvement is enabled by quantitative feedback and innovative ideas.

*Source: own calculated using IBM SPSS software and survey data from Annex 3.*

The results of the correlation analysis presented in Tanle 2.13 show that there are some statistically significant and strong relationships between business process modeling (BPMdl) maturity levels and the level of local economic development in Latvian municipalities. For example, the strongest correlations are observed between process-related culture and the level of local economic development ( $r = 0.793$ ,  $p < 0.001$ ) and between methods supporting BPMdl activities and the level of local economic development ( $r = 0.670$ ,  $p < 0.001$ ). However, correlation analysis does not allow us to identify the direction of these connections, i.e. whether BPMdl maturity levels are driving local economic development and not vice versa. To find out, we conducted a regression analysis in which the resulting variable was a quantified measure of local economic development, average annual income tax per capita, and the factor variables were BPMdl maturity levels in relation to the six core elements of BPMng. Using the stepwise method of inclusion of variables, the following linear regression equation was obtained:

$$y = 316.52 + 113,63x_2 + 112.64x_6, \quad (1)$$

where:

$y$  – the average annual income tax per capita, eur;

$x_2$  – BPMdl maturity level in relation to governance (establishes accountability and decision-making structures), 1–5;

$x_6$  – BPMdl maturity level in relation to culture (process-related collective values and beliefs), 1–5.

Excluded variables:

$x_1$  – BPMdl maturity level in relation to strategic alignment (ensures processes align with organizational strategy), 1–5;

$x_3$  – BPMdl maturity level in relation to methods (tools and techniques supporting BPMdl activities), 1–5;

x<sub>4</sub> – BPMdl maturity level in relation to information technology (IT solutions supporting process activities), 1–5;

x<sub>5</sub> – BPMdl maturity level in relation to people (skills and knowledge of individuals managing processes)), 1–5.

Source: own calculated using IBM SPSS software and survey data from Annex 3.

The results of the regression analysis show that BPMdl maturity levels (in particular in relation to its methods and culture) is a driving force for local economic development in Latvian municipalities. Specifically, each additional score of process-related methods increases the average annual income tax per capita by 113.63 euros, and the additional score of process-related culture – by 112.64 euros. All other correlating factors of BPMdl (governance and people – Table 2.13) are not the driving force of local economic development in Latvian municipalities, but rather are themselves driven by it.

To obtain even more stable results of the empirical study of business process modeling (BPMdl) in the context of business process management (BPMng), discriminant analysis was carried out in order to find among the BPMdl factors those ‘discriminating’ variables, which determine statistically significantly those group, into which a particular municipality will included – the group with a less developed economy or the group with a more developed economy.

The first two results of discriminant analysis presented in Tables 2.14 and 2.15 are test results and indicate the possibility of carrying out discriminant analysis as such on this particular sample, consisting of 43 municipalities. Table 2.14 presents the coefficients of the discriminant function.

The correlation coefficient between the calculated values of the discriminant function and actual group membership, equal to 0.918 (Table 2.14), is satisfactory (Sweet & Grace-Martin, 2012).

Table 2.14

**Test result of discriminant analysis: eigenvalues, Latvian municipalities,  
N = 43, 2024**

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	5.326	100.0	100.0	0.918

Source: own calculated using IBM SPSS software and survey data from Annex 3.

Table 2.15

**Test result of discriminant analysis: Wilks' Lambda, Latvian municipalities,  
N = 43, 2024**

Test of function(s)	Wilks' Lambda	Chi-square	df	Statistical significance, p
1	0.158	70.095	6	,<0.001

*Source: own calculated using IBM SPSS software and survey data from Annex 3.*

The test conducted using the Wilks' Lambda criteria for whether the mean values of the discriminant function differ significantly among themselves in both groups of municipalities – with a less developed economy and with a more developed economy, shows a very significant result ( $p < 0.001$ ) (Table 2.15).

The main result of the discriminant analysis is a classification table showing the accuracy of the predictions hit (Table 2.16), as well as test results indicating the statistical significance (i.e. real 'discriminant power') of all potentially 'discriminating' variables included in the analysis (Table 2.17).

The classification results obtained in the course of discriminant analysis and presented in Table 2.16 indicate that out of 26 cases of municipalities with a less developed economy, using discriminant analysis model, 25 municipalities were correctly predicted to fall precisely into this group, i.e. in 96.2% of cases. One case out of 26 (3.8%) was mistakenly attributed to the group of municipalities with a more developed economy. In turn, in the group of municipalities with a more developed economy, 1 case (5.9%) was erroneously assigned to the 'wrong' group, but it was correctly predicted that they would fall into the group with of municipalities with a more developed economy for 16 cases, i.e. for 94.1% of municipalities.

The main result of applying discriminant analysis is the average level of correctness of predictions of cases falling into the corresponding group of municipalities: with a less developed economy and with a more developed economy. In our analysis,  $25 + 16 = 41$  cases correctly predicted to fall into the corresponding group, which is 95.3% (Table 2.16). This is a very high indicator of correctness of predictions (**Sweet & Grace-Martin, 2012**), showing that in 95% of cases it is possible to know what level of local economic development in a municipality is, looking only at BPMdl maturity levels in this municipality.

Table 2.16

**Classification results of discriminant analysis, Latvian municipalities,  
N = 43, 2024**

Period of measurement	Units	Groups of municipalities	Predicted group membership		Total
			Municipalities with a less developed economy	Municipalities with a more developed economy	
Original	Count	Municipalities with a less developed economy	25	1	26
		Municipalities with a more developed economy	1	16	17
	%	Municipalities with a less developed economy	96.2	3.8	100.0
		Municipalities with a more developed economy	5.9	94.1	100.0

Note: 95.3% of original grouped observations classified correctly.

Source: own calculated using IBM SPSS software and survey data from Annex 3.

The answer to the question of which of the six analyzed variables (BPMdl maturity levels in relation to the core elements of BPMng) have to be looked at in order to immediately say (with an 95% of correctness) which of the two groups a particular municipality will fall into can be found in the following table. Table 2.17 shows the statistical significance (i.e. real 'discriminant power') of the potentially 'discriminating' BPMdl factors participated in the discriminant analysis.



Table 2.17

**Statistical significance of the potentially ‘discriminating’ BPMdl factors participated in the discriminant analysis, Latvian municipalities, N = 43, 2024**

BPMdl maturity levels in relation to the core elements of BPMng*	Wilks' Lambda	F	Statistical significance, p
Strategic alignment, 1–5**	0.971	1.206	0.279
Governance, 1–5	0.898	4.652	0.037
Methods, 1–5	0.480	44.374	< 0.001
Information technology, 1–5	0.966	1.438	0.237
People, 1–5	0.614	25.820	< 0.001
Culture, 1–5	0.264	114.272	< 0.001

\* Strategic alignment – ensures processes align with organizational strategy;

Governance – establishes accountability and decision-making structures;

Methods – tools and techniques supporting BPMdl activities;

Information technology – IT solutions supporting process activities;

People – skills and knowledge of individuals managing processes;

Culture – process-related collective values and beliefs.

\*\* BPMdl maturity levels scale:

1 (initiales) – processes are unstructured and unpredictable, success depends on individual effort and heroics;

2 (managed) – processes are defined and documented but might not be standardized, practices are repeatable;

3 (defined) – processes are standardized, documented and communicated across the organization, there are established standards and guidelines;

4 (quantitatively managed) – processes are measured and controlled, there is a focus on quantitative performance management;

5 (optimizing) – continuous process improvement is enabled by quantitative feedback and innovative ideas.

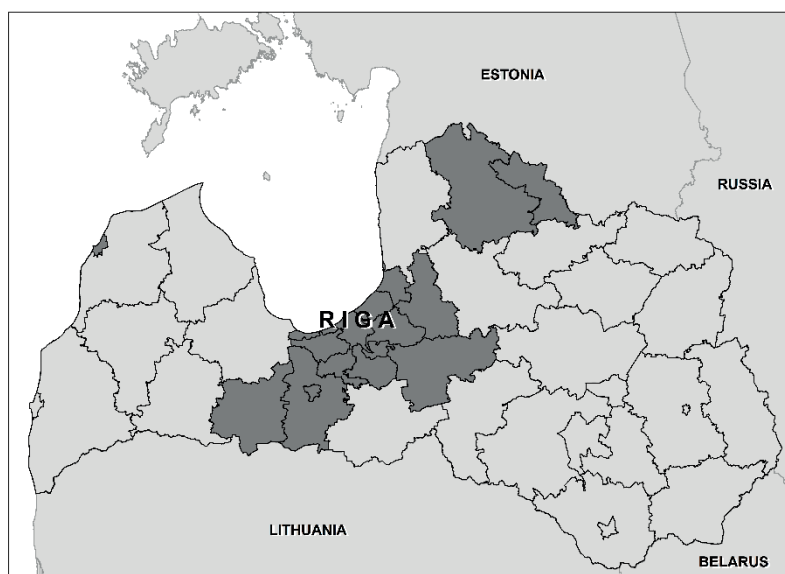
*Note:* the grouping variable is the level of local economic development in Latvian municipalities.

*Source:* own calculated using IBM SPSS software and survey data from Annex 3.

The data presented in Table 2.17 indicates that, as in the comparison of means and in correlation and regression analysis, BPMdl maturity levels in relation to the two core elements of BPMng (strategic alignment and information technology) are not statistically significant also for predicting the level of local economic development in a particular municipality. In turn, BPMdl

maturity levels in relation to its [BPMdl] governance ( $p = 0.037$ ), and especially methods, people and culture ( $p < 0.001$ ) are those ‘discriminating’ variables that determine the level of local economic development in Latvian municipalities.

Geographically, the group of Latvian municipalities with a more developed economy and a more mature BPMdl is concentrated around the capital of Latvia (Fig. 2.2), as well as near the border with Estonia (Estonia is the most economically developed country among Latvia's neighboring countries – Kochetkov & Masharskiy, 2023).



**Fig. 2.2. Geographical concentration of the group of Latvian municipalities with a more developed economy,  $n = 17$ , 2024**

*Source: own compiled using ArcGIS software and the data from Annex 3.*

This pronounced concentration of more economically developed Latvian municipalities around Riga reminiscent of the typology of Latvian territories resulting from the cluster analysis carried out in Section 2.1 and visualized in Figure 2.1. Thus, according to the research hypothesis (stated in the introduction to the study), contextual data on Latvian municipalities is a necessary input for data-based machine diagnostics of local, territorial development. Applying statistical software and AI tools, contextual tacit knowledge (“data in the air”) hypothetically accessible only to experts who are actually physically in the context of local territorial development, falls into the

purview of both data science and computer science along with measurable explicit data (“data in databases”), and this is the main result of this study, which does not accord with the initially proposed research hypothesis.

**2.4. Comparison of ‘traditional’ statistical software (IBM SPSS) and ‘innovative ’AI tool (ChatGPT 4o) for data-vased machine diagnostics of local territorial development**

The further comparison is essential for finalizing the study as it provides a comprehensive understanding of how IBM SPSS and ChatGPT 4o can be utilized individually or together to overcome the unique challenges of data-based diagnostics of local territorial development. It ensures methodological rigor, and supports practical, real-world decision-making in a complex and interdisciplinary field.

Table 2.18

**Comparison of ‘traditional’ statistical software (IBM SPSS) and ‘innovative’ AI tool (ChatGPT 4o) for Data-Based Machine Diagnostics of local territorial development**

Criteria for comparison	‘Traditional’ statistical software (IBM SPSS)	‘Innovative ’AI tool (ChatGPT 4o)
Strengths	(1) Offers robust statistical methods (correlation, regression, cluster analysis) suited for well-defined datasets and established hypotheses (2) Highly standardized processes ensure reproducible results (3) Empowers researchers with fine-grained control over the analysis, essential when 'knowledge in the air' complements explicit data (4) Can handle large datasets, ensuring compatibility with structured frameworks like territorial analytic data (TAD)	(1) Capable of processing unstructured data, such as annual reports, to perform qualitative tasks like SWOT-analyses (2) Can integrate tacit knowledge by synthesizing narrative and quantitative data (3) Automates labor-intensive processes like document summarization and data categorization (4) Reduces the technical knowledge required to conduct complex diagnostics

Weaknesses	(1) Limited adaptability for dynamic or unstructured data analysis (2) Requires significant expertise in statistical modeling and data preparation (3) Lacks the ability to interpret tacit or contextual knowledge unless explicitly modeled	(1) Prone to occasional inaccuracies due to reliance on probabilistic models (2) Results may vary depending on the clarity and structure of input data (3) Generates outputs based on context, making it harder to reproduce exact results (4) Potential data privacy and governance issues when used for sensitive datasets
When and why to use	(1) Best suited for scenarios where explicit data dominates, and the analysis requires rigor and reproducibility (2) Useful for researchers with strong statistical expertise working on structured datasets (e.g., comparing GDP or environmental metrics across municipalities)	(1) Ideal for exploratory research or when unstructured or qualitative data (e.g., textual reports) needs to be synthesized (2) Valuable for gaining insights in situations where contextual knowledge is crucial but difficult to quantify

*Source: own elaborated based on the Sections 2.1, 2.2 and 2.3 as well as Sen et al., 2023; Xue et al., 2024.*

As for combined use of statistical software and AI tool, IBM SPSS can perform foundational statistical analysis, while ChatGPT 4o adds value by interpreting qualitative findings or simulating decision-making scenarios. For example, IBM SPSS can identify clusters of municipalities (Section 2.1) based on explicit indicators, and ChatGPT 4o can analyze corresponding SWOT matrixes (Section 2.2) to provide actionable insights.

## CONCLUSIONS

The main conclusions of the study, aimed at analyzing the capabilities of statistical software (IBM SPSS) and AI tool (ChatGPT 4o) for data-based machine diagnostics of local territorial development using the case of Latvian municipalities, are as follows:

- (1) there are significant disparities between capital-centered and remote Latvian municipalities, emphasizing the need for targeted data analysis tailored to the unique economic and environmental contexts of each group;
- (2) centered Latvian municipalities benefit from proximity to Riga, infrastructure, and population density, resulting in higher economic productivity; remote municipalities face the economic isolation, environmental inefficiencies, and lower levels of transportation efficiency;
- (3) clustering identified five distinct typological groups of Latvian municipalities (the capital, centered and remote cities, centered and remote counties), shaped by factors such as proximity to Riga, infrastructure quality, and population density;
- (4) statistical software (IBM SPSS) and AI tool (ChatGPT 4o) demonstrated their ability to uncover nuanced perspectives, such as proximity to Riga being both a competitive advantage and threat, depending on context;
- (5) within machine SWOT-analysis, contextual strengths (e.g., economic stability, strategic location) and weaknesses (e.g., demographic challenges, dependence on traditional sectors) have been successfully identified for Latvian municipalities;
- (6) within machine SWOT-analysis, opportunities such as leveraging EU funding, green energy projects, and digitalization initiatives were highlighted, and threats like global economic instability, environmental risks, and infrastructure challenges were identified for Latvian municipalities;
- (7) statistical software (IBM SPSS) and AI tool (ChatGPT 4o) allowed tailored data analysis focusing on specific discourse of local territorial development, which includes social, economic, and environmental factors, however, their work requires human intervention to mitigate data limitations and contextualize findings, ensuring actionable outcomes;

- (8) data-based machine diagnostics of local territorial development integrated contextual considerations, ensuring a more holistic understanding of territorial development challenges and opportunities;
- (9) the combined use of 'traditional' statistical software (IBM SPSS) and 'innovative' AI tool (ChatGPT 4o) offers a balanced approach, leveraging the rigor of traditional methods with the adaptability of AI. This synergy ensures comprehensive and actionable diagnostics of local territorial development;
- (10) significant differences in business process modeling (BPMdl) maturity levels were observed between municipalities with more and less developed economies: municipalities with less developed economies exhibited lower maturity of BPMdl in governance, methods, people, and culture of process modeling, including the process of diagnostics of local territorial development;
- (11) the worked out methodology of data-based machine diagnostics of local territorial development is transferable to other regional contexts, allowing for comparative studies and collaborative territorial planning (for example, within the European Union).

These conclusions underscore the transformative potential of data-based machine diagnostics of local territorial development in addressing spatial disparities and fostering sustainable development of municipalities with different social, economic and environmental context.

### **Final remarks and discussion**

Within this study, the authors have developed a system that facilitates repeating the analysis or parts of it in the future. This is evident from the following aspects:

- the study employs a structured system of databases: statistical, documental, and sociological. These databases are periodically collected and updated, ensuring the continuity of data inputs for future diagnostics of local territorial development;
- the methodology includes discourse analysis, data mining (including comparison of means, correlation analysis, cluster analysis, regression analysis, discriminant analysis). and SWOT-analysis. These methods are standardized and can be applied repeatedly to similar datasets, making the system replicable;
- the study conceptualizes diagnostics of local territorial development as a business process, using tools like IDEF0 diagrams and maturity models to

structure activities. This structured approach ensures that the steps are well-documented and can be replicated;

- the use of IBM SPSS for statistical analysis and ChatGPT 4o for SWOT analysis provides consistency. These tools are widely available and well-documented, making it easy to replicate the analysis with similar data;
- the study produces outputs like SWOT-matrixes and developmental typologies of territories, which are based on repeatable and transparent analytical steps;
- the diagnostics process is aligned with regulatory guidelines, such as Regulations No. 413 "On annual public reports" in Latvia, ensuring that the approach is grounded in standardized requirements.

These features collectively make the analysis system replicable, allowing future researchers or administrators to repeat or build upon the work using updated data and similar methodology. Larger and better-resourced municipalities (e.g., Riga City, Marupe County, Yurmala City) are more likely to adopt the analyzed tools as part of their management processes, particularly for resource allocation and strategic planning. With the proper training and investment, the system can become widespread as less-developed municipalities improve their BPMdl maturity and IT infrastructure. The authors' methodology for periodic data collection, use of AI for qualitative insights, and integration of structured and unstructured data could become a cornerstone for modernized municipal processes. By integrating contextual data and explicit metrics, the diagnostics process can significantly improve resource allocation, strategic planning, and policy development. The methodology is designed to be scalable, allowing it to be applied not only in Latvian municipalities but also in similar contexts internationally.

While parts of the authors' work, especially those aligned with existing legal frameworks and requiring minimal technical adaptation, can become part of regular business processes in Latvian municipalities immediately, full integration will depend on addressing challenges like resource allocation, training, and infrastructure development. Over time, with support from policymakers and stakeholders, the authors' methodologies have the potential to become standard practice across all municipalities.

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## **ANNEX**



**SWOT-matrixes of local territorial development for Latvian municipalities,  
created by AI tool (ChatGPT 4o), N = 43, 2023**

The task for AI tool (ChatGPT 4o): “Based on the attached Public Report 2023 (in Latvian), conduct a SWOT-analysis to understand the strengths, weaknesses, opportunities and threats for the municipality”.

**Riga City** (the capital of Latvia, Cluster 1)

Strengths	Weaknesses
<p>1. <b>Economic Stability:</b> Riga experienced a steady increase in budget revenue, particularly from income tax and property tax. The city's budgetary income in 2023 exceeded expectations by €123.7 million, demonstrating a strong fiscal position.</p> <p>2. <b>Tourism and Transport Hub:</b> Riga is a key destination for tourism, with a growing number of visitors. The city has a well-developed public transportation network, including trams, trolleybuses, and buses, along with an important seaport and proximity to Riga International Airport, which boosts the local economy.</p> <p>3. <b>Educational Investments:</b> Significant resources are allocated to education, with €468.4 million (36% of the budget) directed towards educational development, ensuring quality and modernized facilities.</p> <p>4. <b>Strategic Infrastructure Projects:</b> Riga has successfully implemented major infrastructure projects, including road and transport upgrades, supported by EU funds. This includes projects like the reconstruction of the Salu Bridge and the development of the Eastern Highway.</p>	<p>1. <b>Ageing Infrastructure:</b> Some sectors, like public transport and urban infrastructure, still require significant upgrades. Persistent delays in construction and high costs hinder swift progress.</p> <p>2. <b>Demographic Challenges:</b> The city's population has been declining since 2017, with a slight decrease in 2023 despite temporary growth due to migration influx from Ukraine.</p> <p>3. <b>Traffic and Congestion:</b> Traffic congestion remains an issue in urban areas, requiring continuous investment and planning to improve mobility and reduce delays.</p> <p>4. <b>Economic Disparities:</b> There is a noticeable income gap between public and private sectors, with wages in the private sector trailing behind the public sector, potentially affecting employment dynamics.</p>



Opportunities	Threats
<p><b>1. EU Funding for Urban Development:</b> The availability of EU funds offers opportunities for sustainable urban development, including green energy projects and public space revitalization.</p> <p><b>2. Tourism Growth:</b> Increasing tourist numbers, especially from foreign countries, present opportunities for economic growth through the hospitality and service sectors.</p> <p><b>3. Digital and Green Transition:</b> Initiatives in digitalization and green energy can position Riga as a leading city in innovation, attracting businesses and reducing environmental impact.</p> <p><b>4. Business and Investment:</b> The establishment of business-friendly environments and infrastructure development can attract more foreign investment, fostering economic diversification.</p>	<p><b>1. Global Economic Instability:</b> Economic fluctuations and global crises could impact tourism and investment, potentially affecting local revenue and business growth.</p> <p><b>2. Environmental Risks:</b> Climate change and rising sea levels pose risks to Riga's coastal areas, requiring investments in coastal protection and adaptation strategies.</p> <p><b>3. Construction and Material Costs:</b> High costs of construction materials and a shortage of skilled laborers may delay or limit the scope of essential urban development projects.</p> <p><b>4. Dependence on Traditional Sectors:</b> Reliance on established sectors like trade and transport can make the economy vulnerable to industry-specific downturns or technological shifts.</p>

Summary: This SWOT-analysis illustrates Riga's strengths in economic stability, education, and infrastructure, while highlighting the challenges of ageing infrastructure, demographic decline, and the need for economic diversification.

**Ventspils City** (centered city, Cluster 2)

Strengths	Weaknesses
<p>1. <b>Port and Logistics Hub:</b> Ventspils is known for its strategic port, which plays a crucial role in Latvia's economy. The port is a major logistics hub, supporting the city's economic stability and providing employment.</p> <p>2. <b>Tourism and Culture:</b> Ventspils has a well-developed tourism sector with attractions like the seaside, historical sites, and cultural events, making it a significant destination for both local and international tourists.</p> <p>3. <b>Strong Investment in Education and Innovation:</b> The city invests in education, with a focus on science, technology, engineering, and mathematics (STEM) fields. There are initiatives to support innovation and technological development, enhancing the city's appeal to young professionals.</p> <p>4. <b>Public Infrastructure Development:</b> Ongoing projects in urban renewal and infrastructure development, including improvements to roads, public spaces, and the waterfront, contribute to the city's quality of life,</p>	<p>1. <b>Economic Dependence on the Port:</b> Ventspils' economy is heavily reliant on the port and related logistics sectors, which can make it vulnerable to fluctuations in global trade and maritime industries.</p> <p>2. <b>Limited Industrial Diversification:</b> The city lacks significant diversification in its industrial base, focusing primarily on logistics, tourism, and traditional manufacturing, limiting opportunities for economic growth in other sectors.</p> <p>3. <b>Demographic Challenges:</b> The population is experiencing a decline, with an ageing demographic. This trend impacts the local labor market and long-term economic sustainability.</p> <p>4. <b>Skill Gaps in the Workforce:</b> Despite investment in education, there are gaps in skilled labor, particularly in high-tech and specialized fields, which could hinder economic diversification efforts.</p>
Opportunities	Threats
<p>1. <b>EU Funding for Development Projects:</b> Access to EU funds provides opportunities for Ventspils to invest in sustainable development projects, including green energy, infrastructure, and urban renewal,</p> <p>2. <b>Expansion of Tourism:</b> The city's tourism potential can be further developed by promoting its natural and cultural assets, investing in marketing, and enhancing tourist infrastructure.</p>	<p>1. <b>Global Economic Fluctuations:</b> The city's heavy reliance on port-related activities makes it vulnerable to global economic changes and fluctuations in international trade.</p> <p>2. <b>Environmental Risks:</b> As a coastal city, Ventspils faces risks from climate change, including sea-level rise and severe weather events, which could affect both the port and tourism sectors.</p>

### 3. Innovation and Technology Sector

**Growth:** Continued investment in education and innovation can drive the growth of high-tech industries, attracting startups and young professionals to the city.

### 4. Renewable Energy Initiatives:

Opportunities exist for Ventspils to focus on renewable energy projects, aligning with sustainability goals and reducing dependence on traditional energy sources.

### 3. Competition from Other Ports:

Competition from other Baltic ports and changes in global shipping routes may impact Ventspils' port activities and economic stability.

### 4. Demographic Decline:

The ongoing decline in population and the ageing demographic pose long-term threats to the labor market and economic sustainability, potentially limiting the city's growth prospects.

**Summary:** This SWOT-analysis highlights Ventspils' strengths in logistics, education, and tourism, while also acknowledging vulnerabilities related to economic dependence on the port and demographic challenges.

**Yelgava City** (centered city, Cluster 2)

Strengths	Weaknesses
<p>1. <b>Industrial Growth:</b> Jelgava has a robust industrial sector with notable strengths in metalworking, mechanical engineering, woodworking, and food production. The processing industry contributes significantly to economic growth, with a high export share (75.7% in 2023).</p> <p>2. <b>Educational Investments:</b> The city prioritizes education, as seen in the opening of a new engineering-focused high school and modernized kindergartens, aiming to provide a contemporary learning environment.</p> <p>3. <b>Public Infrastructure Development:</b> Ongoing infrastructure projects, such as road upgrades, water tourism facilities, and social service centers, enhance urban development and quality of life.</p> <p>4. <b>Strategic Location:</b> Jelgava's location near Riga facilitates access to a larger job market and economic opportunities, making it an attractive place for residents and businesses.</p>	<p>1. <b>Ageing Population:</b> The demographic trend shows a declining and ageing population, which increases the demographic burden and affects the availability of a skilled workforce.</p> <p>2. <b>Economic Dependence on Traditional Industries:</b> While industrial sectors are strong, there is a reliance on traditional industries, which may limit diversification and innovation in the economy.</p> <p>3. <b>Low Wage Growth:</b> Jelgava's wage increase was the slowest among other major cities, leading many qualified professionals to seek employment in Riga for better salaries.</p> <p>4. <b>Infrastructure and Construction Challenges:</b> The city faces delays in infrastructure projects due to high construction costs and a lack of skilled workers.</p>
Opportunities	Threats
<p>1. <b>Expansion of Tourism and Cultural Projects:</b> Jelgava can leverage its cultural and historical heritage to attract more tourists, enhancing its visibility and economy through events and infrastructure projects.</p> <p>2. <b>Renewable Energy Initiatives:</b> Investments in clean and sustainable energy, such as infrastructure projects aligned with EU sustainability goals, offer a path for economic and environmental benefits.</p>	<p>1. <b>Demographic Decline:</b> A shrinking population with a growing number of elderly residents could strain social services and impact the city's long-term sustainability.</p> <p>2. <b>Economic Vulnerability:</b> Dependency on traditional industrial sectors makes the city susceptible to global market fluctuations, impacting local businesses.</p> <p>3. <b>Environmental Challenges:</b> As an industrial hub, Jelgava must address</p>

3. **EU and State Funding:** Access to EU and state funds for public projects and infrastructure improvements presents opportunities to modernize the city's infrastructure and services.

4. **Development of Industrial Parks:** The creation of the Zemgale Industrial Park aims to revitalize degraded areas and attract private investments, promoting economic development.

environmental concerns to maintain sustainable growth, especially in sectors like manufacturing and energy.

4. **Competition from Riga:** Proximity to Riga, while advantageous, also means competing for talent and businesses, as the capital city offers higher wages and more diverse job opportunities.

Summary: This SWOT-analysis highlights Jelgava's strengths in industrial capacity and educational investment while acknowledging challenges related to demographics and economic diversification.

**Yurmala City** (centered city, Cluster 2)

Strengths	Weaknesses
<p><b>1. Tourism and Natural Resources:</b> Jūrmala is a prominent resort town, attracting international visitors due to its beaches, spas, and natural parks like Ķemeri National Park.</p> <p><b>2. Strong Cultural and Sports Infrastructure:</b> The municipality has a rich cultural scene with numerous cultural heritage sites and modern sports facilities. Jūrmala supports a variety of cultural and sports events, including international competitions.</p> <p><b>3. Education Investment:</b> Significant investments have been made in modernizing educational facilities, including school renovations and the development of new sports infrastructure.</p> <p><b>4. Public Transport and Mobility Improvements:</b> The municipality has enhanced public transport by offering free rides to residents on city buses and trains between Rīga and Ķemeri, promoting greener mobility.</p>	<p><b>1. Seasonal Economy:</b> The local economy heavily relies on tourism, which can lead to economic fluctuations between the tourist season and off-season.</p> <p><b>2. High Construction Costs and Project Delays:</b> Challenges in the construction sector, such as material shortages and a lack of skilled workers, have delayed significant projects, including school renovations and the coastal protection works at Lielupe.</p> <p><b>3. Demographic Challenges:</b> Although there has been a slight increase in population, the demographic structure indicates an ageing population, which could impact long-term workforce stability.</p> <p><b>4. Dependency on Traditional Sectors:</b> The economy is heavily reliant on retail, real estate, and traditional services, with limited diversification into technology and high-value industries.</p>
Opportunities	Threats
<p><b>1. Expansion of Tourism and Cultural Projects:</b> The municipality has the potential to further develop its cultural tourism, capitalizing on projects like the "Catch Ziedonis" cultural route and historical park restorations.</p> <p><b>2. Sustainable Urban Development:</b> Jūrmala can continue to invest in green and energy-efficient projects, such as public infrastructure upgrades and green</p>	<p><b>1. Economic Impact of Global Events:</b> External factors like geopolitical tensions and global economic instability can affect the availability of construction materials and tourism, impacting local projects and economic stability.</p> <p><b>2. Environmental Risks:</b> Being a coastal city, Jūrmala faces risks from coastal erosion, storms, and rising sea</p>

mobility, aligning with global sustainability trends.

**3. Education and Youth Engagement:**

Ongoing investments in education and youth engagement through specialized programs and international projects can foster a skilled local workforce.

**4. Business Support Initiatives:** Initiatives like business incubators, grants for new enterprises, and support for local businesses can drive economic growth and entrepreneurship.

levels, which could impact its natural assets and tourism industry.

**3. Population Ageing:** An ageing demographic may lead to increased demands for social services and healthcare, impacting the municipality's budget and resources.

**4. Competition in Tourism:** With the global tourism industry recovering, Jūrmala faces competition from other destinations in the Baltics and beyond, which may affect visitor numbers and revenue.

**Summary:** This SWOT-analysis outlines Jūrmala's strengths in tourism, culture, and public services, while acknowledging its economic and demographic challenges.

**Daugavpils City** (remote city, Cluster 3)

Strengths	Weaknesses
<p><b>1. Industrial and Manufacturing Hub:</b> Daugavpils has a strong industrial base, particularly in metalworking, mechanical engineering, textiles, and woodworking, with many companies exporting products globally.</p> <p><b>2. Education and Workforce Training:</b> Investments in education and professional training, including partnerships with local educational institutions, support workforce development and skill enhancement.</p> <p><b>3. Tourism and Cultural Appeal:</b> The city has notable cultural and tourism attractions, including the Daugavpils Fortress and various museums, contributing to the local economy and cultural diversity.</p> <p><b>4. Strategic Use of EU Funds:</b> The city has successfully leveraged EU funding for key infrastructure projects, such as transport, heating, water supply, and waste management, improving public services.</p>	<p><b>1. Demographic Decline:</b> Daugavpils faces a declining population with a notable ageing demographic, impacting the local labor market and economic growth.</p> <p><b>2. Economic Dependence on Traditional Industries:</b> The local economy relies heavily on traditional sectors like manufacturing and trade, which may limit diversification and innovation.</p> <p><b>3. High Unemployment Among Target Groups:</b> Although overall unemployment is declining, there remain significant challenges with long-term unemployment and youth unemployment.</p> <p><b>4. Limited High-Tech Industry Presence:</b> There is a lack of development in high-tech and innovation-driven industries, limiting opportunities for economic diversification.</p>
Opportunities	Threats
<p><b>1. Expansion of Industrial Parks:</b> The development of industrial parks, like the planned ALTOP Industrial Park, offers opportunities to attract new businesses and boost local employment.</p> <p><b>2. Tourism Development:</b> Enhancing tourism infrastructure and promoting local cultural heritage can draw more visitors, contributing to the economy.</p> <p><b>3. Green and Sustainable Initiatives:</b> Opportunities exist to invest in green energy, sustainable urban development,</p>	<p><b>1. Global Economic Fluctuations:</b> The city's economic reliance on exports makes it vulnerable to global market changes and trade disruptions.</p> <p><b>2. Environmental Risks:</b> Climate change and environmental issues pose threats, particularly for infrastructure resilience and public health.</p> <p><b>3. Demographic Challenges:</b> The continuing decline in population and an ageing demographic strain local</p>



and infrastructure, aligning with EU goals for environmental sustainability.

**4. Cross-Border Cooperation:** Daugavpils' geographical position offers potential for increased cross-border cooperation with neighboring regions, enhancing trade and cultural exchanges.

resources, affecting long-term economic sustainability.

**4. Competition from Other Regions:** Daugavpils faces competition from other Latvian and Baltic cities for investment, talent, and tourism, potentially limiting growth opportunities.

Summary: This SWOT-analysis highlights Daugavpils' industrial strengths and challenges with demographic trends and economic diversification, while emphasizing opportunities in sustainable development and cross-border cooperation.

**Liepaya City** (remote city, Cluster 3)

Strengths	Weaknesses
<p><b>1. Industrial and Economic Growth:</b> Liepāja is the second-largest manufacturing city in Latvia, with a well-established industrial sector that includes metalworking, machinery, textiles, and construction. The city has seen a notable increase in manufacturing output over the past five years.</p> <p><b>2. Tourism and Culture:</b> The city is a significant cultural center with strong tourism potential, attracting visitors with its cultural events, historical sites, and coastal attractions. The construction of new cultural facilities, like the “Liedags” kindergarten, highlights ongoing investment in local infrastructure.</p> <p><b>3. Port and Transport Infrastructure:</b> Liepāja has a strategic port that supports logistics and international trade, alongside well-developed transport infrastructure. This includes enhancements in public transportation and road networks.</p> <p><b>4. Educational Investments:</b> The city has prioritized educational improvements, with modernized schools, kindergartens, and investment in professional training institutions that cater to local industry needs.</p>	<p><b>1. Demographic Challenges:</b> Liepāja faces a declining and ageing population, which impacts the local labor force and poses challenges for long-term economic sustainability.</p> <p><b>2. Unemployment Issues:</b> The city has a relatively high unemployment rate, particularly among youth and long-term unemployed groups, which may indicate a skills mismatch in the local economy.</p> <p><b>3. Economic Dependence on Traditional Industries:</b> The economy heavily relies on traditional sectors like manufacturing and construction, with limited diversification into high-tech or innovative sectors.</p> <p><b>4. Infrastructure Maintenance:</b> While there is investment in new infrastructure, the maintenance and modernization of existing facilities, especially in older parts of the city, remain a challenge.</p>
Opportunities	Threats
<p><b>1. Green and Sustainable Development:</b> There are opportunities for Liepāja to invest in green energy</p>	<p><b>1. Global Economic Volatility:</b> The city's reliance on manufacturing and exports makes it vulnerable to global economic</p>

<p>and sustainable infrastructure, aligned with EU funding and sustainability goals. This includes initiatives in renewable energy and waste management.</p> <p><b>2. Tourism Expansion:</b> Enhancing tourism through cultural events, coastal development, and improved facilities can drive economic growth, leveraging the city's cultural and natural assets.</p> <p><b>3. Foreign Investment and Industrial Parks:</b> The development of industrial parks and attracting foreign investments can boost the local economy, creating more jobs and diversifying the economic.</p> <p><b>4. Cross-Border Cooperation:</b> Liepāja's geographical position facilitates cooperation with neighboring countries, enhancing trade, cultural exchange, and joint projects.</p>	<p>shifts, particularly fluctuations in demand and supply chains.</p> <p><b>2. Environmental Risks:</b> As a coastal city, Liepāja faces risks from climate change, such as rising sea levels and extreme weather events, which could impact its port and tourism sectors.</p> <p><b>3. Competition from Other Cities:</b> Liepāja faces competition from other Latvian and Baltic cities for tourism, investment, and skilled labor, which could limit its growth potential.</p> <p><b>4. Long-Term Demographic Trends:</b> The ageing population and declining birth rates present a long-term challenge for sustaining a productive workforce and maintaining economic vitality.</p>
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**Summary:** This SWOT-analysis underscores Liepāja's strengths in industry and cultural appeal, while acknowledging the demographic and economic challenges that require strategic planning for sustainable development.

**Rezekne City** (remote city, Cluster 3)

Strengths	Weaknesses
<p><b>1. Economic and Industrial Base:</b> Rēzekne has strong industrial foundations, particularly in metalworking, woodworking, food processing, and logistics. The city's focus on traditional industries supports local employment and economic stability.</p> <p><b>2. Educational and Cultural Investment:</b> The city has significant investments in education and culture, including partnerships with educational institutions and projects that preserve and promote local heritage.</p> <p><b>3. Special Economic Zone (SEZ):</b> The Rēzekne Special Economic Zone (SEZ) provides tax incentives and infrastructure advantages, attracting investments and fostering industrial development.</p> <p><b>4. Strategic Location:</b> Positioned in the Latgale region, Rēzekne serves as an important economic and cultural hub for Eastern Latvia, with strong connections to neighboring regions and countries.</p>	<p><b>1. Demographic Decline:</b> The city faces a persistent population decline, with a shrinking and ageing population that challenges local economic sustainability.</p> <p><b>2. High Unemployment:</b> Rēzekne has a relatively high unemployment rate, especially among youth and long-term unemployed groups, highlighting issues with job availability and skill matching.</p> <p><b>3. Economic Dependence on Traditional Industries:</b> A significant reliance on manufacturing and traditional sectors limits diversification and innovation in emerging industries like technology.</p> <p><b>4. Budget Deficit:</b> The city's budget has faced a deficit in recent years, reflecting challenges in balancing revenue with public expenditure and reliance on state and EU funds.</p>
Opportunities	Threats
<p><b>1. Expansion of SEZ:</b> The SEZ offers ongoing opportunities for attracting new industries, investments, and creating jobs, enhancing the city's economic diversification.</p> <p><b>2. Sustainable Development:</b> There is potential for investing in green energy projects, eco-friendly construction, and sustainable urban development, aligning with EU funding priorities.</p> <p><b>3. Tourism Growth:</b> Rēzekne has untapped tourism potential with its cultural heritage sites, natural beauty, and</p>	<p><b>1. Economic Vulnerability:</b> The heavy reliance on traditional industries and exports makes Rēzekne susceptible to global economic changes and shifts in market demand.</p> <p><b>2. Climate and Environmental Risks:</b> Environmental challenges, including climate change, could impact local infrastructure, particularly in flood-prone or industrial areas.</p> <p><b>3. Competition from Other Regions:</b> Competition from other cities in Latvia and the Baltic region for investments,</p>

historical landmarks, which can be promoted to boost the local economy.

4. **Cross-Border Cooperation:** The city's proximity to neighboring countries provides opportunities for cross-border projects and trade, fostering economic and cultural ties.

skilled labor, and tourism may limit Rēzekne's growth prospects.

4. **Continuing Demographic Challenges:** A further decline in population and the ageing demographic pose a long-term risk to the labor market and public services sustainability.

Summary: This SWOT-analysis captures Rēzekne's strong industrial base and potential for development, while highlighting challenges related to demographics, economic dependence, and budgetary constraints.

**Adazi County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Positive Demographic Growth:</b> Ādaži has shown a stable increase in population, reaching 24,000 residents in 2023, with growth driven by both natural population increases and migration,</p> <p>2. <b>Strategic Location:</b> Positioned just 25 km from Riga, the municipality benefits from proximity to the capital, making it an attractive location for residents and businesses.</p> <p>3. <b>Strong Investment in Infrastructure:</b> Significant investments have been made in improving transportation infrastructure, including road maintenance and public space enhancements, as well as water and environmental projects like the strengthening of Gauja's left bank.</p> <p>4. <b>Diverse Economic Activity:</b> The municipality hosts nearly 2,000 active businesses, with strong representation in food production, construction, and service industries, showing a dynamic local economy.</p>	<p>11. <b>Dependence on Traditional Industries:</b> The local economy relies heavily on traditional sectors such as construction and food production, which may limit opportunities for diversification and innovation.</p> <p>2. <b>Environmental Vulnerability:</b> The region faces risks related to climate change, including flooding concerns, which necessitate ongoing investments in protective infrastructure like the "Carnikavas SES" solar panel park and flood protection in Carnikava.</p> <p>3. <b>Limited High-Tech Industry:</b> While there is business dynamism, the municipality has limited high-tech and innovative industry presence, potentially impacting future economic diversification.</p> <p>4. <b>Project Delays:</b> Some infrastructure projects have been slower than anticipated due to challenges in the construction sector, including material shortages and high costs.</p>
Opportunities	Threats
<p>1. <b>Sustainable Development:</b> Ādaži has potential to continue its sustainable growth through green projects such as solar energy parks and eco-friendly public facilities, aligning with global trends and EU funding.</p> <p>2. <b>Tourism Development:</b> The municipality can further develop tourism by leveraging its natural assets, including coastal areas and the Gauja River, to attract both domestic and international tourists.</p>	<p>1. <b>Climate Change Impact:</b> Environmental risks like coastal erosion and flooding remain a threat, requiring substantial and continuous investment in adaptation and protection.</p> <p>2. <b>Global Economic Fluctuations:</b> Economic reliance on traditional sectors makes the local economy sensitive to global market changes and economic instability.</p> <p>3. <b>Competitive Pressure:</b> As Ādaži is close to Riga, it faces competition in attracting businesses and talent, as the</p>

**3. Education and Youth Engagement:**

Investment in education and youth services, such as building new schools and kindergartens, offers opportunities to strengthen the future workforce and community ties.

**4. EU Funding:** The region can benefit from continued access to EU funds for infrastructure and environmental projects, supporting long-term sustainable development.

capital offers broader opportunities and higher salaries.

**4. Population Ageing:** Although the population is currently growing, there are long-term concerns about an ageing demographic, which could impact the labor market and social services in the future.

Summary: This SWOT-analysis highlights Ādaži's strengths in demographics, infrastructure, and location, while noting the challenges in economic diversification and environmental risks.

**Aizkraukle County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Location:</b> Aizkraukle is situated where three Latvian cultural regions intersect (Vidzeme, Zemgale, and Sēlija), making it a hub for cultural and economic activities.</p> <p>2. <b>Diverse Natural Resources:</b> The municipality has significant forestry and agricultural resources, with more than half of the territory covered by forests (57%) and a notable portion dedicated to agriculture (29%).</p> <p>3. <b>Strong Energy Sector:</b> The region benefits from the Pļaviņu Hydroelectric Power Plant, which is a key player in Latvia's energy production and the largest hydroelectric plant in the Baltic states.</p> <p>4. <b>Cultural Engagement:</b> Aizkraukle supports active cultural life, including participation in national events like the Latvian Song and Dance Festival.</p>	<p>1. <b>Population Decline:</b> The population has been decreasing annually, affecting economic stability and tax revenue. A projected decrease of 16.3% by 2030 poses challenges for local development.</p> <p>2. <b>Limited Economic Diversification:</b> The economy is heavily reliant on traditional sectors such as agriculture and forestry, which may limit opportunities for innovation and resilience to economic shifts.</p> <p>3. <b>Ageing Population:</b> A growing percentage of residents are above working age, leading to a shrinking labor force and potentially increased social service demands.</p> <p>4. <b>Education and Infrastructure Gaps:</b> Some educational institutions and social infrastructure require updates to meet modern standards.</p>
Opportunities	Threats
<p>1. <b>EU Funding and Investment:</b> Continued access to EU structural funds for infrastructure improvements, such as modernizing public facilities and boosting energy efficiency, presents growth opportunities.</p> <p>2. <b>Tourism Development:</b> Aizkraukle has potential for tourism, with natural landscapes and cultural heritage that can be leveraged for local economic development.</p> <p>3. <b>Renewable Energy Initiatives:</b> The focus on renewable energy, including the potential to expand hydroelectric power</p>	<p>1. <b>Economic Vulnerability:</b> The reliance on primary industries, such as agriculture and forestry, makes the economy susceptible to market fluctuations and environmental risks.</p> <p>2. <b>Demographic Challenges:</b> Ongoing population decline and an ageing demographic can strain public services and reduce the tax base, impacting long-term financial stability.</p> <p>3. <b>Environmental Concerns:</b> Maintaining the quality of natural resources, especially water and forests, is crucial for the municipality,</p>



and other clean energy projects, aligns with global sustainability trends.

4. **Cross-Border Collaboration:** Partnerships with neighboring regions and countries can foster economic and cultural exchange, attracting investment and boosting local enterprises.

as any degradation could impact tourism and local livelihoods.

4. **Economic Inequality:** Differences in economic activity between regions within Aizkraukle may lead to disparities in service access and economic opportunity.

Summary: This SWOT-analysis reflects Aizkraukle's strengths in natural resources and cultural engagement, while addressing the challenges posed by demographic shifts and economic dependencies.

**Bauska County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Stable Population:</b> Bauska maintains a relatively stable population of over 43,000 residents, showing slight growth in recent years, which is positive for local development.</p> <p>2. <b>Agricultural and Economic Base:</b> The municipality's economy benefits from a strong agricultural sector, with 51% of its territory being agricultural land. This contributes to seasonal employment and economic stability,</p> <p>3. <b>Cultural and Educational Investment:</b> There are ongoing investments in cultural heritage, educational institutions, and public services, with projects improving local schools, kindergartens, and cultural centers.</p> <p>4. <b>Infrastructure Development:</b> Significant efforts have been made in infrastructure projects, including road construction and renovation, as well as the development of public facilities, supporting regional accessibility and quality of life.</p>	<p>1. <b>High Dependence on Agriculture:</b> The local economy heavily relies on agriculture, making it sensitive to agricultural market fluctuations and limiting diversification into other sectors.</p> <p>2. <b>Demographic Challenges:</b> An ageing population and concerns about the long-term sustainability of local services remain significant issues, particularly in maintaining a young and active workforce.</p> <p>3. <b>Infrastructure Maintenance:</b> Despite investments, maintaining and upgrading existing infrastructure, particularly in smaller rural areas, is a continuous challenge.</p> <p>4. <b>Budgetary Constraints:</b> The municipality faces budgetary limitations that may affect the speed and scope of development projects, especially those requiring significant financial investment.</p>
Opportunities	Threats
<p>1. <b>Rail Baltica Development:</b> The future Rail Baltica line is expected to enhance connectivity, providing better mobility for residents and fostering economic opportunities through improved logistics and accessibility.</p> <p>2. <b>Tourism Enhancement:</b> The municipality has a rich cultural and historical heritage, offering opportunities to boost tourism, particularly through festivals, heritage projects, and improved tourist facilities.</p>	<p>1. <b>Economic Vulnerability:</b> Dependence on the agricultural sector exposes the local economy to risks from climate change, environmental conditions, and market volatility.</p> <p>2. <b>Demographic Decline:</b> A continued decline in the younger population and an ageing demographic could limit the availability of a skilled workforce, affecting economic growth.</p> <p>3. <b>Competition for Investment:</b> The proximity to larger cities like Riga could</p>

3. **Green and Sustainable Projects:** There are opportunities to invest in renewable energy, environmental projects, and sustainable agriculture, aligning with broader EU sustainability goals.

4. **Cross-Regional Cooperation:** The municipality's central location in Latvia, near other key regions and the Lithuanian border, facilitates cooperation with neighboring areas for economic and cultural projects.

lead to competition for attracting businesses and skilled labor, potentially limiting local economic development.

4. **Environmental Risks:** Climate change and environmental challenges, such as the risk of flooding in agricultural areas, pose threats to the local economy and infrastructure.

Summary: This SWOT-analysis highlights Bauska's strengths in agriculture and cultural heritage, while acknowledging challenges related to demographics and economic diversification, with opportunities in sustainable development and regional cooperation.

Cesis County (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Population Growth:</b> Cēsis experienced a positive demographic shift, with a slight increase in population, driven by internal migration, indicating the municipality's attractiveness to new families.</p> <p>2. <b>Strong Educational and Cultural Investments:</b> Cēsis has made substantial investments in education, including the modernization of 19 educational institutions and the development of the Kosmosa Izziņas Center, which attracts students and promotes STEM education.</p> <p>3. <b>Tourism and Public Engagement:</b> The municipality boasts significant tourism appeal, with initiatives like pedestrian-friendly city centers and the opening of the Kosmosa Izziņas Center. Additionally, high community involvement in participatory budgeting and local forums strengthens social cohesion.</p> <p>4. <b>Sustainable Energy Initiatives:</b> Cēsis has increased the use of renewable energy in public heating, reaching 85% in Cēsis's centralized system, showcasing commitment to environmental sustainability.</p>	<p>1. <b>Budget Limitations:</b> Budget constraints limit the scope of development projects, particularly in maintaining older infrastructure and expanding services.</p> <p>2. <b>High Dependence on Tourism and Traditional Sectors:</b> The economy is heavily reliant on tourism and traditional industries, which can be vulnerable to seasonal variations and economic downturns.</p> <p>3. <b>Aging Population:</b> Despite the recent growth, the municipality faces a long-term demographic challenge with an aging population, which could impact workforce sustainability and demand for social services.</p> <p>4. <b>Infrastructure Challenges in Rural Areas:</b> Maintaining and upgrading rural infrastructure remains a challenge, impacting transportation and accessibility in remote parts of the municipality.</p>
Opportunities	Threats
<p>1. <b>Expansion of Eco-Friendly Initiatives:</b> Cēsis can continue developing renewable energy and sustainable infrastructure projects, aligning with EU funding for green initiatives.</p> <p>2. <b>Enhanced Tourism Potential:</b> With new cultural and educational centers, there is potential to boost year-round</p>	<p>1. <b>Economic Dependence on Tourism:</b> Economic shifts or global crises affecting tourism could have a disproportionate impact on the municipality, given its reliance on tourism revenue.</p> <p>2. <b>Environmental Risks:</b> Climate change presents risks, particularly with infrastructure resilience and the need</p>

tourism, benefiting the local economy and supporting businesses during off-peak seasons.

**3. Cross-Regional Collaboration:** Positioned in Vidzeme, Cēsis can leverage regional partnerships to enhance economic opportunities, attract investment, and strengthen cultural exchanges.

**4. Growth in Digital and Creative Industries:** Investments in creative industries, such as the “Rainis” digital district, offer opportunities to attract young professionals and support innovation.

for continued adaptation measures in flood-prone areas.

**3. Population Decline in Rural Areas:** While Cēsis city is growing, rural areas face population decline, which can affect local economies and demand for public services.

**4. Rising Construction Costs:** Increased costs in construction and materials may delay or reduce the scale of necessary infrastructure projects.

Summary: This SWOT-analysis highlights Cēsis’s strengths in population growth, education, and tourism, while addressing challenges in economic diversity and demographic stability, with opportunities for sustainable development and innovation in the digital and creative sectors.

**Dobele County** (centered county, Cluster 4)

Strengths	Weaknesses
<p><b>1. Agricultural and Industrial Base:</b> Dobele has a strong agricultural foundation, benefiting from fertile land, especially around Tērvete and Dobele, which supports crop production and forestry in the Auce area.</p> <p><b>2. Community Engagement and Support Programs:</b> The municipality has prioritized community welfare through various support programs, including grants for business development and initiatives in culture and sports, enhancing local engagement.</p> <p><b>3. Investment in Infrastructure:</b> Significant funds have been allocated to infrastructure improvements, such as road maintenance and the development of centralized water and sewage systems, which elevate the quality of public services.</p> <p><b>4. Educational Investments:</b> The municipality maintains free meals for all school children and invests in educational facilities, signaling a strong commitment to youth development and education.</p>	<p><b>1. Demographic Decline:</b> Dobele faces a demographic challenge with a declining and ageing population, which impacts the workforce and long-term economic stability.</p> <p><b>2. Economic Dependence on Agriculture:</b> Heavy reliance on agriculture and limited diversification into other industries may restrict economic resilience, especially during fluctuations in the agricultural market.</p> <p><b>3. Infrastructure Maintenance Needs:</b> Although new projects are underway, maintaining and upgrading existing infrastructure, particularly in rural areas, remains a costly and ongoing challenge.</p> <p><b>4. Budget Constraints:</b> Limited financial resources place constraints on development projects and may slow progress on planned initiatives.</p>
Opportunities	Threats
<p><b>1. Green Energy and Sustainability Projects:</b> There is potential for Dobele to develop renewable energy initiatives and eco-friendly infrastructure, aligning with EU green goals and available funding opportunities.</p> <p><b>2. Tourism Development:</b> Dobele's natural landscapes and cultural assets offer an opportunity to boost tourism, which could diversify and strengthen the local economy.</p>	<p><b>1. Environmental Risks:</b> Climate change and weather variability pose risks to Dobele's agriculture-dominated economy, affecting crop production and natural resources.</p> <p><b>2. Economic Fluctuations:</b> Dependence on the agricultural sector makes the local economy sensitive to price changes and market shifts, which could impact stability.</p>

**3. Expansion of Support Programs:**

Increasing support for local businesses and innovation can drive economic growth and foster a more resilient economy.

**4. Cross-Regional Partnerships:** Dobeles proximity to the Latvian-Lithuanian border provides opportunities for cross-border collaboration in economic, cultural, and environmental projects.

**3. Competition for Talent and Investment:**

Dobeles competes with larger Latvian cities for skilled workers and investments, potentially limiting its growth prospects.

**4. Population Decline:** A continued reduction in the younger population threatens the municipality's ability to sustain a dynamic workforce and maintain social services.

Summary: This SWOT-analysis captures Dobeles's strengths in agriculture, community support, and infrastructure, while highlighting demographic challenges and economic dependencies that shape its strategic planning.

**Kekava County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Population Growth:</b> Ķekava has seen consistent population growth over the last decade, with a current population of over 32,000 residents. This growth signifies the municipality's attractiveness as a residential area, supported by its proximity to Riga.</p> <p>2. <b>Strategic Infrastructure Development:</b> The completion of the Ķekava bypass in 2023 has improved local traffic flow, safety, and connectivity to Riga, benefiting both residents and businesses .</p> <p>3. <b>Community Engagement:</b> Ķekava actively engages its residents through participatory budgeting and regular forums, allowing for community input on projects and decision-making.</p> <p>4. <b>Investment in Renewable Energy:</b> The municipality has made strides in energy efficiency, such as building the largest municipal-owned solar power plant in Latvia, and upgrading public buildings for improved energy performance.</p>	<p>1. <b>High Dependence on Proximity to Riga:</b> While Ķekava benefits from its location near the capital, it relies on this proximity for economic opportunities, making it less self-sufficient.</p> <p>2. <b>Limited Economic Diversification:</b> The local economy is primarily supported by traditional sectors, with fewer high-tech or innovation-driven industries, limiting growth potential in emerging sectors.</p> <p>3. <b>Ongoing Infrastructure Maintenance Needs:</b> Despite new infrastructure projects, maintaining existing roads, utilities, and public facilities remains a costly and ongoing challenge for the municipality.</p> <p>4. <b>Budget Constraints:</b> Limited financial resources hinder the scope of projects, impacting long-term plans for expansion and development, especially in rural areas.</p>
Opportunities	Threats
<p>1. <b>Green Development Initiatives:</b> There is significant potential to expand on current sustainability projects, including additional renewable energy facilities and eco-friendly public spaces.</p> <p>2. <b>Enhanced Tourism and Recreational Facilities:</b> The development of pedestrian and cycling paths and natural attractions, like the new opportunities for cycling tourism, presents potential for expanding tourism revenue.</p>	<p>1. <b>Environmental Risks:</b> Climate change poses challenges, especially regarding infrastructure resilience and potential flooding in specific areas, which may require additional resources for adaptation.</p> <p>2. <b>Economic Vulnerability:</b> The reliance on traditional industries makes the local economy susceptible to market fluctuations and global economic changes.</p>



**3. Youth and Education Programs:**

Planned investments in educational facilities and youth programs, including new sports complexes, will support workforce development and improve the quality of life for younger residents.

**4. Cross-Municipal Collaboration:**

Proximity to other municipalities offers the chance to develop shared services, such as waste management and public transport, benefiting from regional cooperation.

**3. Competition from Riga:**

With its proximity to Riga, Ķekava faces strong competition in retaining talent and attracting investments, as many residents and businesses are drawn to the capital's wider opportunities.

**4. Population Ageing:**

While the population is growing, there are concerns about the ageing demographic, which could affect future workforce availability and increase demand for healthcare and social services.

**Summary:** This SWOT-analysis highlights Ķekava's strengths in community engagement, infrastructure improvements, and sustainability efforts, while noting challenges in economic diversification and dependence on the capital's proximity.

**Limbazhi County** (centered county, Cluster 4)

Strengths	Weaknesses
<p><b>1. Agricultural and Tourism Potential:</b> Limbaži has a strong base in agriculture and a growing tourism sector, enhanced by its coastal location, which appeals to visitors and supports local businesses.</p> <p><b>2. Rich Cultural Heritage:</b> The municipality has a deep-rooted cultural identity, celebrated through events like the 800th anniversary of Limbaži, and supports numerous cultural organizations and public participation.</p> <p><b>3. Strategic Location and Transport Infrastructure:</b> With proximity to Riga and Estonia, Limbaži benefits from easy access to major markets and logistical connections. New infrastructure projects, like road improvements, further strengthen connectivity.</p> <p><b>4. Sustainable Development Initiatives:</b> Investments in renewable energy, such as planned wind parks, reflect a commitment to sustainability and long-term resource management.</p>	<p><b>1. Demographic Decline:</b> The municipality faces an ageing and declining population, which impacts the labor market and poses challenges for economic sustainability.</p> <p><b>2. High Dependence on Traditional Industries:</b> Economic reliance on agriculture and limited diversification into technology or high-growth sectors restricts the municipality's economic resilience.</p> <p><b>3. Budget Constraints and Debt:</b> Previous commitments to debt repayment limit the municipality's capacity to fund new projects and initiatives.</p> <p><b>4. Infrastructure Gaps in Rural Areas:</b> While urban areas have seen infrastructure improvements, rural regions face ongoing challenges in access to quality services and infrastructure.</p>
Opportunities	Threats
<p><b>1. Expansion of Tourism and Recreation:</b> With its natural and cultural assets, Limbaži has potential for tourism growth, especially through further development of recreational sites and historical attractions.</p> <p><b>2. EU Funding for Sustainable Projects:</b> Access to EU funding provides opportunities to support green projects, infrastructure, and rural</p>	<p><b>1. Climate Change and Environmental Risks:</b> Being a coastal area, Limbaži faces risks associated with climate change, including rising sea levels and increased flooding.</p> <p><b>2. Economic Volatility in Agriculture:</b> The local economy's dependence on agriculture makes it vulnerable to market changes and environmental factors that impact crop yields.</p>

development, which aligns with broader sustainability goals.

3. **Cross-Border Collaboration:** Positioned near the Estonian border, Limbaži can benefit from cross-border partnerships, particularly in areas like tourism, trade, and cultural exchange.

4. **Innovation in Local Business Support:** Programs to encourage new business initiatives and promote local products can drive economic growth and diversification.

3. **Labor Market Challenges:** The ageing population and workforce limitations could hamper future economic growth and strain social services.

4. **Competition from Larger Cities:** Limbaži competes with more urbanized areas like Riga for investment, talent, and resources, potentially limiting its growth.

Summary: This SWOT-analysis highlights Limbaži's cultural and geographic strengths while acknowledging demographic and economic dependencies, with opportunities for sustainable growth and cross-border cooperation.

**Marupe County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Population Growth and Youthful Demographic:</b> Mārupe has experienced significant population growth, with a relatively young average age of 35.9 years, indicating a strong potential workforce and demand for family services.</p> <p>2. <b>Investment in Education and Public Services:</b> The municipality prioritizes education, allocating a large portion of its budget to schools, and has modernized multiple educational facilities.</p> <p>3. <b>Strong Infrastructure Development:</b> Recent infrastructure projects, such as road improvements and a new multifunctional stadium, enhance transportation, recreational options, and overall connectivity.</p> <p>4. <b>Thriving Business Environment:</b> The municipality actively fosters a business-friendly atmosphere, as evidenced by the consistent growth of new businesses outpacing closures for four consecutive years.</p>	<p>1. <b>High Dependence on Proximity to Riga:</b> Mārupe's economic and demographic growth is closely tied to its location near Riga, which may limit economic independence.</p> <p>2. <b>Challenges in Infrastructure Maintenance:</b> While new infrastructure projects are underway, maintaining and upgrading existing facilities continues to strain resources.</p> <p>3. <b>Budget Constraints:</b> Financial limitations affect the municipality's ability to implement planned projects fully, particularly in areas like rural infrastructure.</p> <p>4. <b>Limited Industry Diversification:</b> The economy is primarily focused on services and construction, with less representation in technology and high-growth industries, impacting economic resilience.</p>
Opportunities	Threats
<p>1. <b>Green Energy and Sustainable Development:</b> Mārupe has started renewable energy projects, such as a municipally owned solar power plant, and can further develop its sustainability efforts to reduce environmental impact.</p> <p>2. <b>Expansion of Recreational and Cultural Facilities:</b> As the population grows, developing parks, cultural sites, and sports facilities can enhance</p>	<p>1. <b>Environmental Risks:</b> Climate change presents risks, such as potential flooding and other weather-related challenges, requiring ongoing investment in adaptive infrastructure.</p> <p>2. <b>Global Economic Fluctuations:</b> The local economy's dependence on sectors sensitive to economic cycles, such as real estate and construction, leaves it vulnerable to downturns.</p>

residents' quality of life and attract tourism.

**3. Enhanced Digital Services for Residents:** With initiatives in digital service provision, Mārupe can improve access to public services, making it easier for residents to engage with the municipality.

**4. Regional Collaboration:** Proximity to other municipalities opens doors for shared services and collaboration on transportation, waste management, and economic development projects.

**3. Competition from Riga:** The municipality's close proximity to Riga means it competes for skilled labor, investment, and residents, potentially impacting growth.

**4. Ageing Infrastructure in Rural Areas:** As resources are often directed to new projects, maintaining and upgrading older infrastructure, especially in rural areas, remains challenging.

**Summary:** This SWOT-analysis captures Mārupe's strengths in youth demographics, infrastructure, and a favorable business environment, alongside challenges with economic reliance on Riga and environmental risks.

**Ogre County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Large and Diverse Population:</b> With over 61,000 residents, Ogre is one of the most populated municipalities in Latvia, featuring a broad working-age demographic which supports the local economy.</p> <p>2. <b>Robust Education and Cultural Investments:</b> Significant investments have been made in educational facilities, such as the construction of the new Ogre State Gymnasium building and the development of cultural venues.</p> <p>3. <b>Strategic Location and Infrastructure:</b> The municipality benefits from its strategic location near Riga and efficient infrastructure improvements, like the establishment of new sports arenas, which enhance community engagement and quality of life.</p> <p>4. <b>Focus on Renewable Energy:</b> Ogre has made strides in energy sustainability, with new biomass boiler plants that reduce dependence on natural gas.</p>	<p>1. <b>Budget Constraints:</b> Rising construction and energy costs, alongside a limited budget, strain resources, particularly for maintaining infrastructure and social services.</p> <p>2. <b>Demographic Challenges:</b> Although the population is large, there are concerns about the ageing demographic, which could impact workforce availability and increase demand for healthcare.</p> <p>3. <b>Economic Dependence on Traditional Sectors:</b> The economy heavily relies on sectors like construction and manufacturing, with less emphasis on high-tech industries, limiting diversification.</p> <p>4. <b>Environmental Vulnerabilities:</b> The municipality's geography increases vulnerability to natural disasters such as flooding, which could disrupt local infrastructure.</p>
Opportunities	Threats
<p>1. <b>Expansion of Tourism and Cultural Heritage Projects:</b> Ogre has significant potential for expanding tourism, especially with its historical sites and new cultural centers.</p> <p>2. <b>Sustainable Development Initiatives:</b> With EU funding, the municipality can further develop green energy projects and eco-friendly infrastructure, aligning with sustainability goals.</p> <p>3. <b>Cross-Municipal Collaboration:</b> Proximity to Riga and other municipalities offers opportunities for</p>	<p>1. <b>Economic Instability and Rising Costs:</b> The increasing costs of materials and energy pose a threat to the municipality's financial stability and the timely completion of projects.</p> <p>2. <b>Global Economic Volatility:</b> Relying on traditional sectors makes the economy sensitive to economic cycles, which may affect long-term stability.</p> <p>3. <b>Competition from Larger Cities:</b> Ogre faces competition for skilled labor and investment from larger cities, especially</p>

shared projects in transportation, waste management, and economic development.

4. **Youth Engagement Programs:** By enhancing youth services and sports facilities, Ogre can foster a vibrant young community that strengthens the future workforce.

Riga, which could limit local growth opportunities.

4. **Long-Term Climate Risks:** The municipality’s geography and reliance on infrastructure projects make it vulnerable to the effects of climate change, particularly extreme weather events and flooding.

Summary: This SWOT-analysis highlights Ogre’s strengths in population size, strategic investments, and sustainability efforts, while acknowledging challenges in budget constraints, demographics, and environmental vulnerabilities.

**Olaine County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Location:</b> Olaine benefits from a strategic position near Riga, facilitating commuting, attracting businesses, and supporting transit.</p> <p>2. <b>Strong Industrial and Service Sectors:</b> The municipality has a robust industrial sector, particularly in chemicals and logistics, alongside a growing service sector that supports employment and economic stability.</p> <p>3. <b>Investment in Education and Public Services:</b> Significant investments in education, such as the construction of new kindergartens and schools, support the development of local talent and improve community well-being.</p> <p>4. <b>Environmental Initiatives:</b> Olaine has implemented renewable energy projects and improvements in public utilities, demonstrating commitment to sustainability.</p>	<p>1. <b>Reliance on Industrial Sectors:</b> The local economy is heavily dependent on industrial sectors, which may limit economic diversity and resilience against industry-specific downturns.</p> <p>2. <b>Aging Infrastructure in Some Areas:</b> Maintenance of aging infrastructure remains challenging, particularly in areas requiring upgrades to meet modern standards.</p> <p>3. <b>Demographic Challenges:</b> Despite growth, there are concerns about an ageing population which could affect the workforce and increase the demand for healthcare and social services.</p> <p>4. <b>Budget Constraints:</b> Limited financial resources restrict the ability to fund certain projects fully, particularly in infrastructure and social services.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green Energy Projects:</b> There are opportunities to expand renewable energy facilities and sustainable practices, aligning with EU funding opportunities for green initiatives.</p> <p>2. <b>Tourism and Recreation Development:</b> Enhancing recreational facilities and promoting natural attractions could boost tourism and provide additional revenue streams.</p> <p>3. <b>Regional Partnerships:</b> Olaine's proximity to Riga and other municipalities opens doors for</p>	<p>1. <b>Economic Dependency on Key Sectors:</b> Heavy reliance on specific industries makes the economy vulnerable to shifts in market demand or economic downturns affecting these sectors.</p> <p>2. <b>Environmental Risks:</b> Climate change poses risks, such as increased flooding, which requires investment in adaptive infrastructure.</p> <p>3. <b>Competitive Pressure from Riga:</b> As a nearby major urban center, Riga attracts both businesses and talent, creating competition that may impact Olaine's growth.</p>



regional collaborations, particularly in public services and infrastructure projects.

**4. Investment in Digitalization:** Continued focus on digital service improvements can streamline public services and enhance accessibility for residents.

**4. Aging Population:** The long-term demographic shift toward an older population could strain social services and reduce workforce availability.

Summary: This SWOT-analysis highlights Olaine’s strategic location and industrial base, while noting challenges in economic dependency and demographic trends, with opportunities in green energy and regional collaboration.

**Ropazhi County** (centered county, Cluster 4)

Strengths	Weaknesses
<p><b>1. Population Growth and Engagement:</b> Ropaži experienced strong population growth, particularly in the Stopiņi and Garkalne areas, driven by residential attractiveness and low unemployment. Community engagement is encouraged through participatory budgeting and active consultative councils in each district.</p> <p><b>2. Economic Diversity and Business Support:</b> The municipality supports a range of industries, including large and small enterprises, with a solid foundation in trade, processing, and construction. Support programs, such as grants and tax relief, foster local businesses.</p> <p><b>3. Investment in Education and Infrastructure:</b> Ropaži allocates a substantial portion of its budget to education and infrastructure, reflected in recent improvements to schools, sports facilities, and public utilities.</p> <p><b>4. Commitment to Sustainability:</b> Initiatives in renewable energy, such as solar power facilities, and environmental projects, support the municipality's sustainable development goals.</p>	<p><b>1. Dependence on Surrounding Areas:</b> The municipality relies on proximity to Riga and neighboring municipalities for economic opportunities and employment, which may impact self-sufficiency.</p> <p><b>2. Budgetary Constraints:</b> Limited financial resources restrict the municipality's ability to expand services or maintain infrastructure fully, especially as the population continues to grow.</p> <p><b>3. Aging Infrastructure in Rural Areas:</b> While urban centers receive improvements, maintaining and upgrading infrastructure in rural parts remains challenging.</p> <p><b>4. Demographic Challenges:</b> Although population growth is robust, the municipality faces long-term issues related to an ageing demographic, which could impact workforce availability and demand for social services.</p>
Opportunities	Threats
<p><b>1. Enhanced Regional and International Collaboration:</b> Positioned near Riga, Ropaži has opportunities for partnerships on public services, tourism, and economic projects, including collaborations with international partners like Ukraine.</p> <p><b>2. Development of Green and Sustainable Infrastructure:</b> Ropaži has potential for more eco-friendly projects, including green</p>	<p><b>1. Environmental and Climate Risks:</b> As a geographically diverse municipality, Ropaži faces potential environmental risks, such as flooding, that could impact infrastructure.</p> <p><b>2. Economic Dependence on Key Industries:</b> Reliance on specific industries, like trade and construction, exposes the municipality to market fluctuations.</p>

energy and sustainable urban planning, which aligns with available EU funding.

**3. Growth in Tourism and Cultural Initiatives:** Cultural and recreational projects, such as the Green Road initiative, increase tourism and create new local business opportunities.

**4. Digitalization and Public Service Improvement:** Investment in digital services can streamline public administration and increase accessibility for residents.

**3. Competition for Talent and Resources:** Ropaži competes with Riga and other regions for skilled labor and investment, which may limit local growth and economic diversification.

**4. Infrastructure Demand and Population Growth:** The rapid population increase places pressure on public services and infrastructure, requiring continuous investment that may strain the budget.

Summary: This SWOT-analysis captures Ropaži's strengths in community growth, economic support, and sustainability, while noting challenges related to budget constraints and infrastructure demands amidst population growth.

Salaspils County (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Steady Population Growth:</b> Salaspils has shown consistent population growth, driven by a positive net migration rate, indicating its appeal as a residential area near Riga.</p> <p>2. <b>Strong Financial Management:</b> The municipality maintains stable tax revenues, with 104.06% revenue performance in 2023, allowing for continuous investment in local infrastructure.</p> <p>3. <b>Investment in Infrastructure and Public Services:</b> Salaspils has completed multiple infrastructure projects, such as road upgrades, school sports facilities, and waste management improvements, enhancing community living standards.</p> <p>4. <b>Environmental and Energy Initiatives:</b> Projects like the Salaspils Solar Thermal Plant showcase the municipality's commitment to sustainability and renewable energy, reducing dependence on traditional energy sources.</p>	<p>1. <b>Reliance on Proximity to Riga:</b> The municipality's growth is heavily influenced by its proximity to Riga, creating a dependence on the capital for employment and economic opportunities.</p> <p>2. <b>Infrastructure Maintenance Challenges:</b> Despite recent improvements, the municipality faces challenges in maintaining older infrastructure, particularly in rural areas, which can impact service delivery.</p> <p>3. <b>Aging Population in Rural Areas:</b> While the population in Salaspils city is growing, rural areas face demographic challenges, with an increasing elderly population that may strain social services.</p> <p>4. <b>Budget Limitations:</b> Although financially stable, budget constraints limit the scope of ambitious projects and necessitate careful prioritization of infrastructure and service expansion.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green Projects and Renewable Energy:</b> Salaspils can build on its renewable energy projects, like solar thermal energy, to further position itself as a sustainable municipality and attract EU green funding.</p> <p>2. <b>Enhanced Tourism and Cultural Heritage Initiatives:</b> With the restoration of historic sites and development of parks, Salaspils has the potential to boost local tourism and associated economic benefits.</p>	<p>1. <b>Economic Dependence on Key Sectors:</b> Salaspils's economy relies on specific industries, making it vulnerable to sectoral downturns that could impact employment and local revenues.</p> <p>2. <b>Environmental and Climate Risks:</b> The municipality faces climate-related challenges, such as increased flood risks, which necessitate</p>

3. **Cross-Municipal Collaborations:**

Salaspils’s location offers opportunities for collaboration on infrastructure, public services, and business with neighboring municipalities, enhancing regional integration.

4. **Investment in Digitalization:** By increasing digital services, Salaspils can streamline public administration, improve accessibility for residents, and attract tech-savvy professionals.

resilient infrastructure and proactive environmental policies.

3. **Competition from Riga for Talent**

**and Resources:** Due to its proximity, Salaspils competes with Riga for skilled labor, investment, and resources, which could limit its growth potential.

4. **Inflation and Rising Costs:** Higher costs for materials and services, partly driven by global inflation, could constrain the municipality's ability to complete planned projects within budget.

Summary: This SWOT-analysis reflects Salaspils's strengths in population growth, sustainable development, and financial stability while highlighting challenges in economic reliance on Riga and infrastructure demands. Opportunities lie in green initiatives, digital transformation, and regional collaboration.

**Saulkrasti County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Coastal Location:</b> Saulkrasti's location along the Gulf of Riga attracts seasonal tourism, bolstering local businesses and creating a vibrant summer economy.</p> <p>2. <b>Investment in Infrastructure:</b> Recent upgrades in infrastructure, including road improvements, beach facilities, and energy-efficient public buildings, improve the municipality's appeal and quality of life.</p> <p>3. <b>Cultural Heritage and Events:</b> The municipality fosters cultural engagement through festivals, such as "Saulkrasti Jazz," and educational initiatives, strengthening community ties and enhancing Saulkrasti's reputation as a cultural destination.</p> <p>4. <b>Commitment to Education:</b> Significant investments in education, including fully subsidized school meals and new educational facilities, highlight a commitment to supporting young families and fostering local talent.</p>	<p>1. <b>Dependence on Tourism:</b> Heavy reliance on seasonal tourism creates economic instability, as many local businesses experience reduced revenue outside the tourist season.</p> <p>2. <b>Demographic Challenges:</b> Like many rural areas, Saulkrasti faces issues with an ageing population and youth migration, impacting the workforce and local services.</p> <p>3. <b>Limited Economic Diversification:</b> The economy is primarily tourism-driven, with limited presence in high-growth sectors, which restricts economic resilience and opportunities.</p> <p>4. <b>Budget Constraints:</b> While investment continues in key areas, budget limitations affect the municipality's ability to expand services and infrastructure as needed.</p>
Opportunities	Threats
<p>1. <b>Sustainable Tourism Development:</b> Saulkrasti can leverage its natural landscapes to develop eco-tourism and year-round recreational opportunities, broadening its tourism appeal and reducing seasonal dependence.</p> <p>2. <b>Green Energy Initiatives:</b> Opportunities exist for expanding renewable energy projects, aligned with EU funding, which would enhance sustainability and reduce energy costs.</p> <p>3. <b>Digital Transformation:</b> Improving digital services for residents and</p>	<p>1. <b>Environmental and Climate Risks:</b> Being a coastal area, Saulkrasti faces threats from climate change, including erosion and potential flooding, which could damage infrastructure and impact tourism.</p> <p>2. <b>Economic Dependence on Riga:</b> Many residents commute to Riga for work, creating economic dependency on the capital, which may limit local job growth.</p> <p>3. <b>Competitive Tourism Market:</b> As other nearby regions also enhance</p>

businesses can boost efficiency and accessibility, attracting tech-savvy residents and entrepreneurs.

**4. Partnerships with Nearby Municipalities:** Regional cooperation, especially with nearby cities, can help share resources and attract joint investments, benefitting Saulkrasti's infrastructure and economic growth.

their tourism offerings, Saulkrasti faces strong competition to attract visitors.

**4. Rising Infrastructure Costs:** Increased construction and maintenance costs pose a challenge to ongoing and future infrastructure projects, potentially delaying key initiatives.

Summary: This SWOT-analysis highlights Saulkrasti's strengths in coastal location, cultural engagement, and educational support, while acknowledging challenges in economic stability and **demographic** trends. Opportunities in sustainable tourism, green energy, and regional collaboration are promising, though environmental and economic dependencies present notable threats.

**Sigulda County** (centered county, Cluster 4)

Strengths	Weaknesses
<p><b>1. Strong Tourism and Cultural Appeal:</b> Sigulda is a renowned tourism destination in Latvia, known for its scenic landscapes and extensive cultural activities, including events like the Sigulda Opera Festival, which strengthens its reputation.</p> <p><b>2. Robust Educational Infrastructure:</b> Investments in modernizing educational facilities and digital competence initiatives reflect Sigulda's commitment to educational excellence.</p> <p><b>3. Community Engagement and Support Programs:</b> Sigulda promotes active civic participation through resident councils and a participatory budget, while supporting families with various social and financial assistance programs.</p> <p><b>4. Proactive Sustainability Efforts:</b> The municipality prioritizes green initiatives, including renewable energy projects and environmentally friendly public spaces, positioning Sigulda as a leader in sustainable development.</p>	<p><b>1. Seasonal Economic Dependence:</b> Sigulda's tourism-based economy experiences fluctuations, with high activity in the tourist season but reduced revenue outside peak periods.</p> <p><b>2. Budgetary Limitations:</b> Despite stable revenue sources, Sigulda faces challenges in financing large-scale projects and expanding services, often relying on external funding.</p> <p><b>3. Aging Rural Infrastructure:</b> Maintenance and modernization needs in rural areas outpace available funding, affecting service quality and accessibility in these regions.</p> <p><b>4. Vulnerable to Economic Cycles:</b> The municipality's reliance on tourism and associated service industries makes it susceptible to economic shifts that impact discretionary spending.</p>
Opportunities	Threats
<p><b>1. Enhanced Digitalization of Services:</b> Sigulda has potential to further digitize public services, making them more accessible and efficient, especially for remote and rural residents.</p> <p><b>2. Expansion of Eco-Tourism:</b> Leveraging its natural and historical assets, Sigulda could further develop eco-tourism initiatives, attracting environmentally conscious visitors.</p> <p><b>3. Increased EU Funding for Green Projects:</b> Access to EU funds can support further renewable energy projects,</p>	<p><b>1. Environmental Risks Due to Climate Change:</b> The municipality faces risks such as increased rainfall and flooding, which may affect infrastructure and the tourism sector.</p> <p><b>2. Economic Dependency on Tourism:</b> Heavy reliance on tourism makes the local economy vulnerable to global trends, health crises, and seasonality.</p> <p><b>3. Rising Costs and Inflation:</b> High costs for energy, materials, and services could hinder infrastructure projects and strain the budget .</p>



infrastructure upgrades, and other sustainability initiatives.

**4. Collaborations with Nearby Municipalities:** Regional partnerships offer opportunities for shared services, tourism initiatives, and business collaborations, enhancing resources and visibility.

**4. Competition from Other Tourist Regions:**

Other municipalities and regions in Latvia also invest heavily in tourism, creating competitive pressure for Sigulda to maintain its appeal.

Summary: This SWOT-analysis highlights Sigulda's strengths in tourism, education, and sustainability, while addressing budgetary constraints and seasonal economic reliance, with opportunities in eco-tourism and digital expansion.

**Tukums County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Location and Accessibility:</b> Tukums benefits from proximity to major transport routes and is close to Riga, enhancing its appeal as a residential and business location.</p> <p>2. <b>Diverse Economic Sectors:</b> The municipality has a balanced economic base with strengths in manufacturing, agriculture, and trade, providing resilience to economic fluctuations.</p> <p>3. <b>Investment in Infrastructure:</b> Significant investments in roads, public utilities, and healthcare facilities improve residents' quality of life and support economic development.</p> <p>4. <b>Strong Cultural and Educational Infrastructure:</b> Tukums supports a rich cultural scene and has a well-developed educational network, including schools and vocational training centers.</p>	<p>1. <b>Declining Population:</b> The municipality faces a decrease in population, with many young people leaving for opportunities elsewhere, impacting the local labor market.</p> <p>2. <b>Limited Budget for Expansive Projects:</b> Although the municipality has stable finances, budget constraints limit the ability to invest in large-scale developments.</p> <p>3. <b>Aging Infrastructure in Rural Areas:</b> Infrastructure in more remote areas requires updates and maintenance, which strains the budget and affects service delivery.</p> <p>4. <b>Seasonal Employment Variability:</b> Tukums experiences fluctuations in unemployment due to seasonal work, especially in agriculture and tourism.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green and Sustainable Projects:</b> Opportunities exist to leverage EU funds for green energy and sustainable development, positioning Tukums as an eco-friendly municipality.</p> <p>2. <b>Development of Tourism:</b> The municipality's cultural sites, events, and natural beauty make it suitable for expanding year-round tourism, which could generate additional revenue.</p> <p>3. <b>Cross-Regional Collaborations:</b> Collaborations with nearby municipalities could strengthen services like waste management, transportation, and shared business initiatives.</p>	<p>1. <b>Economic Dependence on Key Sectors:</b> Heavy reliance on agriculture and manufacturing makes the local economy sensitive to changes in these industries.</p> <p>2. <b>Environmental Risks:</b> The area faces risks related to extreme weather, which can affect agriculture and infrastructure, particularly in rural areas.</p> <p>3. <b>Rising Energy and Construction Costs:</b> Increased costs impact the municipality's ability to fund infrastructure projects and maintain affordable energy for residents.</p>

**4. Digital Transformation Initiatives:**

Expanding digital services could streamline public services, making them more accessible to residents and businesses.

**4. Competition for Skilled Workers:**

Proximity to Riga means that Tukums competes for skilled labor, which can hinder local business growth.

Summary: This SWOT-analysis reflects Tukums's strengths in location, infrastructure, and economic diversity, along with challenges in demographic decline and budget constraints. Opportunities in green projects and tourism are promising, but the area faces threats from environmental and economic dependencies.

**Valmiera County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Importance as a Regional Hub:</b> Valmiera is a national development center in Vidzeme, known for its role in administration, education, and industry, reinforcing its influence in the region.</p> <p>2. <b>Stable Economic Growth and Foreign Investment:</b> The municipality shows steady economic growth with significant contributions from sectors like manufacturing, agriculture, and trade, along with foreign investments supporting job creation.</p> <p>3. <b>Commitment to Education and Innovation:</b> Investments in educational infrastructure and partnerships with institutions like Vidzeme University of Applied Sciences promote skills development and innovation.</p> <p>4. <b>Cultural and Social Engagement:</b> Valmiera offers a rich cultural scene, with various events and sports activities, fostering community ties and attracting visitors.</p>	<p>1. <b>Demographic Challenges:</b> Valmiera faces a declining population and an aging demographic, which impacts the local workforce and places demands on healthcare and social services.</p> <p>2. <b>Dependence on Key Industries:</b> The municipality relies heavily on specific industries, making it vulnerable to economic downturns in these sectors.</p> <p>3. <b>Rural Infrastructure Needs:</b> Maintaining and upgrading infrastructure in rural areas remains a challenge, affecting accessibility and service quality.</p> <p>4. <b>Budgetary Limitations:</b> Financial constraints limit the municipality's ability to undertake large-scale projects and support ambitious infrastructure expansions.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green and Sustainable Projects:</b> Opportunities to leverage EU funding for green projects could enhance sustainability and create economic resilience.</p> <p>2. <b>Growth in Tourism and Cultural Development:</b> With its rich historical sites and festivals, Valmiera can further expand tourism initiatives to boost the local economy year-round.</p> <p>3. <b>Digital Transformation:</b> Increased digitalization of public services and infrastructure improvements can</p>	<p>1. <b>Economic Sensitivity to Global Market Fluctuations:</b> Dependency on specific industries exposes the municipality to risks from market changes and global economic instability.</p> <p>2. <b>Environmental Risks:</b> Climate-related threats, such as flooding, can impact infrastructure and agricultural productivity, requiring investment in adaptive infrastructure.</p> <p>3. <b>Competition for Skilled Labor:</b> Valmiera faces challenges in retaining</p>

streamline operations and make services more accessible.

**4. Regional and International Collaborations:** Partnerships with foreign cities and local municipalities can enhance Valmiera’s resources, particularly in business, education, and cultural exchange.

skilled workers who may be attracted to larger urban centers.

**4. Rising Costs and Inflation:** Increasing energy and infrastructure costs strain the budget and can delay essential projects.

Summary: This SWOT-analysis highlights Valmiera’s role as a key regional center with strengths in education, industry, and cultural engagement, while addressing challenges in demographics and economic dependencies, with opportunities for sustainability and collaboration.

**Yelgava County** (centered county, Cluster 4)

Strengths	Weaknesses
<p>1. <b>Strategic Location:</b> Jelgava County's location near Riga and access to main transport routes make it a favorable spot for business and residential development.</p> <p>2. <b>Economic Diversity and Support for Local Businesses:</b> The region supports various sectors, including agriculture, forestry, and manufacturing, and encourages local entrepreneurship with grants and other initiatives.</p> <p>3. <b>Commitment to Education and Infrastructure:</b> Substantial budget allocations are made to support educational institutions, infrastructure, and public facilities, enhancing the quality of life and accessibility.</p> <p>4. <b>Community and Environmental Engagement:</b> Active resident involvement through consultative councils and sustainability projects, such as green waste collection, highlight Jelgava's commitment to community and environmental well-being.</p>	<p>1. <b>Population Decline and Aging Demographics:</b> Like many rural areas, Jelgava faces population loss and an aging population, which affects the labor market and demands for healthcare and social services.</p> <p>2. <b>Dependence on Traditional Sectors:</b> The municipality's economy is largely reliant on agriculture and forestry, which may limit economic resilience against market changes.</p> <p>3. <b>Budgetary Constraints:</b> Financial limitations restrict Jelgava's ability to pursue large-scale projects or expand services to meet the needs of all areas.</p> <p>4. <b>Rural Infrastructure Challenges:</b> Remote parts of the municipality require significant investments in infrastructure, which can be challenging to maintain with limited resources.</p>
Opportunities	Threats
<p>1. <b>Green and Sustainable Development:</b> EU funds can be used to support green projects, such as renewable energy, waste management, and environmentally friendly infrastructure improvements.</p> <p>2. <b>Expansion of Tourism and Cultural Programs:</b> Jelgava's cultural events and natural landscapes offer potential to attract more visitors, bolstering the local economy and creating jobs.</p>	<p>1. <b>Economic Sensitivity to Market Shifts:</b> Heavy reliance on agriculture and forestry means that changes in these markets could impact economic stability.</p> <p>2. <b>Environmental Risks:</b> Climate-related threats, such as severe weather events, may impact agriculture and infrastructure, requiring adaptive measures.</p> <p>3. <b>Increasing Costs and Inflation:</b> Rising energy and material costs can strain the</p>

<p>3. <b>Strengthening Regional Collaborations:</b> Collaborations with nearby municipalities and the capital can enhance resource sharing and service efficiency.</p> <p>4. <b>Digital Transformation of Services:</b> Developing digital public services could improve accessibility and efficiency for residents, especially in rural areas.</p>	<p>budget and hinder the municipality's ability to complete necessary projects.</p> <p>4. <b>Outmigration of Young People:</b> Migration of young people to urban areas or abroad poses a long-term risk to workforce availability and economic growth.</p>
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Summary: This SWOT-analysis identifies Jelgava County's strengths in location, economic support, and community engagement, while recognizing challenges in demographics and budget constraints. Opportunities in green development and tourism are promising, though economic dependencies and environmental threats are noted as significant risks.

**Aluksne County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Active Community Engagement:</b> Alūksne promotes resident involvement through public meetings and local events, enhancing community trust and transparency.</p> <p>2. <b>Rich Cultural and Historical Heritage:</b> Investments in local cultural institutions and historic sites highlight Alūksne’s commitment to preserving heritage, making it attractive for cultural tourism .</p> <p>3. <b>Support for Education and Youth Development:</b> The municipality prioritizes education with various programs in schools and cultural facilities, benefiting youth and fostering talent.</p> <p>4. <b>Economic Diversity:</b> Alūksne supports sectors like tourism, forestry, and agriculture, adding resilience to its economic base.</p>	<p>1. <b>Aging Population and Outmigration:</b> Alūksne faces demographic challenges with an aging population and the migration of youth, impacting labor availability.</p> <p>2. <b>Dependence on External Funding:</b> Heavy reliance on state and EU funds for development limits the municipality’s financial independence and long-term sustainability.</p> <p>3. <b>Infrastructure Maintenance Challenges:</b> Maintaining and upgrading infrastructure in rural areas is costly and challenging due to limited financial resources.</p> <p>4. <b>Limited Housing Options:</b> Shortages in affordable housing hinder population retention and make it difficult to attract new residents.</p>
Opportunities	Threats
<p>1. <b>Tourism Development Potential:</b> Alūksne’s cultural heritage and natural resources present strong opportunities for tourism growth, which can stimulate the local economy.</p> <p>2. <b>Green Energy Projects and EU Funding:</b> Access to EU funds supports renewable energy and sustainable projects, which can improve infrastructure and environmental sustainability.</p> <p>3. <b>Digital Transformation:</b> Expanding digital services can increase municipal efficiency and make services more accessible, especially for rural residents.</p>	<p>1. <b>Climate and Environmental Risks:</b> The municipality is at risk of climate impacts, such as flooding, which could damage infrastructure and disrupt agriculture.</p> <p>2. <b>Economic Vulnerability to Market Fluctuations:</b> Alūksne’s dependence on key sectors makes it sensitive to economic changes, affecting employment and revenue.</p> <p>3. <b>Inflation and Rising Costs:</b> Increasing costs for materials and services strain the budget, potentially delaying essential projects.</p> <p>4. <b>Youth Outmigration:</b> The ongoing trend of youth migration limits the skilled</p>



4. <b>Regional       Collaboration:</b>	workforce and challenges long-term growth.
Collaborations with neighboring municipalities can enhance shared services and improve efficiency in areas like healthcare and transportation.	

Summary: This SWOT-analysis underscores Alūksne's cultural and community strengths, balanced with demographic and financial challenges. Opportunities lie in tourism and sustainable development, while environmental risks and economic dependencies are key threats.

**Augšdaugava County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Diverse Economy:</b> Augšdaugava’s economy includes a wide range of industries, such as agriculture (especially mixed farming and grain production), retail, and transportation services like taxi and freight.</p> <p>2. <b>Investment in Public Infrastructure:</b> The municipality has been actively implementing EU-funded investment projects, including energy efficiency measures, such as in public lighting and the renovation of public buildings.</p> <p>3. <b>Collaboration with Neighboring Regions:</b> The municipality maintains strong cross-border cooperation with regions in Lithuania, Poland, and Georgia, which fosters opportunities for joint projects and resource sharing.</p> <p>4. <b>Support for Small and Medium-Sized Enterprises (SMEs):</b> A relatively high number of registered businesses exist in the region, showing entrepreneurial activity and local economic participation.</p>	<p>1. <b>Declining Population:</b> There is a significant demographic challenge, with the number of deaths far exceeding births (97 births vs. 525 deaths in 2023), leading to a shrinking and aging population.</p> <p>2. <b>High Unemployment:</b> While the unemployment rate in Augšdaugava is 7.7%, it remains higher than the national average (5.7%), and long-term unemployment affects a substantial part of the population.</p> <p>3. <b>Dependence on Traditional Industries:</b> The economy heavily relies on agriculture and retail, which may limit growth in high-tech and knowledge-based industries.</p> <p>4. <b>Infrastructure Challenges in Education and Social Services:</b> Some schools and social housing require modernization, with several housing units reported as unsuitable for living without significant repair.</p>
Opportunities	Threats
<p>1. <b>EU Funding for Sustainable Development:</b> The municipality can continue to leverage EU structural funds to improve energy efficiency, modernize infrastructure, and support local industries. For example, initiatives to improve public lighting and upgrade public buildings will help reduce energy consumption and emissions.</p> <p>2. <b>Tourism Potential:</b> The restoration and promotion of cultural and natural heritage sites, such as “Latgales sēta”</p>	<p>1. <b>Demographic Decline:</b> With more deaths than births and significant long-term unemployment, the workforce is shrinking, which may pose challenges for sustaining economic growth.</p> <p>2. <b>Limited Diversification in Industry:</b> The heavy reliance on agriculture and retail makes the local economy vulnerable to external shocks in these sectors.</p> <p>3. <b>Regional Disparities:</b> The rural nature of many parts of Augšdaugava could hinder access to services, education, and</p>

and Slutišķi 2, can enhance local tourism and economic growth.	employment opportunities compared to more urbanized areas.
3. <b>Investment in Social Services:</b> The municipality is implementing infrastructure improvements for social services, which can increase the quality of life, such as providing housing and care for vulnerable groups.	4. <b>Environmental Risks:</b> Projects aimed at cleaning historically polluted sites (like Višķu mazuta glabātava) indicate a potential environmental risk that, if not properly managed, could harm local health and development.
4; <b>Green Transition:</b> Investments in clean energy, like solar panel installations and electric vehicle infrastructure, offer opportunities for sustainable development.	

Summary: This SWOT-analysis highlights the municipality’s strengths in infrastructure and partnerships, but also the challenges posed by demographic trends and economic dependence on traditional sectors.

**Balvi County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Community Engagement and Business Support:</b> The municipality has actively promoted local businesses through monthly markets and grants for small and medium enterprises, fostering a strong sense of community and local entrepreneurship.</p> <p>2. <b>Significant Infrastructure Investment:</b> Balvi has invested in infrastructure through EU-funded projects to improve roads, parks, and public facilities, enhancing the quality of life and economic opportunities.</p> <p>3. <b>Cultural and Tourism Development:</b> Efforts to restore historical sites and promote military tourism, such as the Stompaku swamp national partisan camps, attract visitors and celebrate local heritage.</p> <p>4. <b>Environmental Initiatives:</b> Investments in waste management and eco-friendly public spaces demonstrate the municipality's commitment to sustainability.</p>	<p>1. <b>Demographic Decline:</b> Balvi faces an ongoing decline in population, especially among the youth, due to migration and an aging demographic, which impacts the workforce and local economy.</p> <p>2. <b>Economic Dependence on Traditional Sectors:</b> The municipality's economy is heavily reliant on agriculture and local trades, which limits diversification and resilience against economic shifts.</p> <p>3. <b>Budget Constraints:</b> Financial limitations affect the municipality's ability to complete large projects, with rising costs in construction and public services stretching the budget.</p> <p>4. <b>Infrastructure Challenges in Rural Areas:</b> Maintaining and upgrading infrastructure in remote areas remains a challenge, affecting accessibility and service quality for rural residents.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green Energy Projects:</b> The municipality can further explore renewable energy projects, leveraging EU funds for sustainable development in line with Latvia's green goals.</p> <p>2. <b>Increased Tourism and Cultural Initiatives:</b> Initiatives like the restoration of historical sites and green pathways attract tourists and boost the local economy, with</p>	<p>1. <b>Economic Instability in Key Sectors:</b> Balvi's reliance on traditional sectors makes it vulnerable to market changes, especially in agriculture, impacting economic stability.</p> <p>2. <b>Environmental Risks:</b> Climate change, particularly the risk of flooding, poses a threat to infrastructure and agricultural productivity in the region.</p> <p>3. <b>Population Decline in Rural Areas:</b> As rural populations decline, the sustainability</p>

potential for expanded seasonal and eco-tourism.

**3. Cross-Regional Collaborations:**

Partnerships with neighboring municipalities and international cooperation, such as ongoing relations with Ukraine, can strengthen economic and cultural ties.

**4. Digitalization of Public Services:**

Continued digital transformation of public services can increase accessibility and efficiency for residents, especially in remote locations.

of local schools, healthcare, and businesses may be affected, leading to further migration.

**4. Rising Energy and Infrastructure Costs:**

Increasing costs of energy and infrastructure maintenance could strain the municipality's budget and delay essential projects.

Summary: This SWOT-analysis illustrates Balvi's strengths in community engagement, infrastructure, and cultural tourism, alongside challenges in demographics and economic dependencies. Opportunities lie in green projects and regional collaboration, with threats posed by economic volatility and environmental risks.

**Dienvidkurzeme County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Extensive Territorial Coverage and Resources:</b> Dienvidkurzeme is the largest municipality by area in Latvia, providing diverse resources and ample space for agricultural, forestry, and tourism development.</p> <p>2. <b>Strong Community and Cultural Initiatives:</b> The municipality invests in cultural events and supports community initiatives, fostering local pride and engagement.</p> <p>3. <b>Commitment to Infrastructure and Environmental Projects:</b> There is a significant focus on infrastructure upgrades, including road improvements and waste management, as well as environmental initiatives like coastal protection and eco-friendly practices.</p> <p>4. <b>Proactive Educational and Social Support Programs:</b> Dienvidkurzeme actively supports education and social welfare, with programs aimed at improving local education quality and providing assistance to vulnerable populations.</p>	<p>1. <b>Population Decline and Workforce Challenges:</b> The municipality faces issues with population decline and an aging demographic, leading to a limited workforce and increasing demand for healthcare and social services.</p> <p>2. <b>Budget Constraints and Dependency on External Funding:</b> Financial limitations restrict large-scale development, and the municipality relies on EU and state funding to realize ambitious projects.</p> <p>3. <b>Challenges in Rural Infrastructure Maintenance:</b> The vast area and scattered rural population pose difficulties in maintaining infrastructure and providing consistent public services across all regions.</p> <p>4. <b>Economic Dependence on Primary Sectors:</b> The local economy is heavily reliant on agriculture and forestry, which limits diversification and resilience.</p>
Opportunities	Threats
<p>1. <b>Expansion of Eco-Tourism and Sustainable Initiatives:</b> The municipality's natural landscapes, including its coastline, present opportunities to develop eco-tourism and attract environmentally conscious visitors.</p> <p>2. <b>Leveraging EU Funds for Green and Infrastructure Projects:</b> EU funding for sustainable energy and infrastructure can</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Coastal erosion and extreme weather events pose significant risks to Dienvidkurzeme's infrastructure and agricultural activities.</p> <p>2. <b>Rising Operational and Energy Costs:</b> Inflation and high energy costs strain the municipal budget, impacting service provision and project sustainability.</p> <p>3. <b>Continued Outmigration of Young People:</b> The trend of youth leaving for</p>

further strengthen Dienvidkurzeme’s development in these areas.

**3. Collaboration with Neighboring**

**Regions:** Partnerships with nearby municipalities can improve resource allocation, enhance regional transport networks, and create a broader economic base.

larger cities or abroad threatens long-term workforce stability and economic growth.

**4. Economic Volatility in Primary**

**Sectors:** Heavy reliance on agriculture and forestry makes the local economy vulnerable to market shifts and environmental factors.

Summary: This SWOT-analysis highlights Dienvidkurzeme’s strengths in community initiatives and infrastructure investment, with challenges in demographics and economic dependency, alongside opportunities for sustainable growth and digitalization, and threats related to environmental and economic volatility.

**Gulbene County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Proactive Infrastructure Investments:</b> Significant developments in road infrastructure, public facility renovations, and energy efficiency projects enhance residents’ quality of life and support sustainable growth.</p> <p>2. <b>Engagement in Community and Environmental Initiatives:</b> Strong community engagement through public consultations and environmental projects, such as waste management and eco-friendly renovations, reflect the municipality’s commitment to sustainability.</p> <p>3. <b>Educational and Cultural Resources:</b> Investments in education, youth programs, and cultural activities foster a robust community, with support for both formal education and extracurricular engagement.</p> <p>4. <b>Stable Financial Management:</b> Despite economic challenges, the municipality maintained financial discipline and balanced its budget, which reflects responsible fiscal practices.</p>	<p>1. <b>Demographic Decline:</b> Population decrease and an aging demographic pose challenges for workforce availability and increased demand on social services.</p> <p>2. <b>Budget Limitations for Expansive Projects:</b> Financial constraints limit the municipality’s ability to carry out larger infrastructure projects and adequately serve all rural areas.</p> <p>3. <b>Dependence on Specific Economic Sectors:</b> The economy heavily relies on agriculture and forestry, which may restrict growth potential and economic resilience against sector-specific downturns.</p> <p>4. <b>Seasonal Employment and Limited Job Diversity:</b> Job opportunities in the area are seasonal and concentrated in a few sectors, limiting year-round employment stability.</p>
Opportunities	Threats
<p>1. <b>Expansion of Green Initiatives:</b> Leveraging EU funds for renewable energy and environmental projects could enhance sustainability, reduce costs, and attract eco-conscious residents.</p> <p>2. <b>Tourism Development Potential:</b> Gulbene’s natural beauty and historical sites create a foundation for expanding</p>	<p>1. <b>Environmental Vulnerabilities:</b> Climate risks, including flooding, pose a threat to agricultural productivity and infrastructure, necessitating adaptation strategies.</p> <p>2. <b>Economic Dependency on Agriculture and Forestry:</b> Heavy reliance on primary sectors exposes the economy to shifts in global markets, impacting employment and revenue.</p>



eco-tourism and cultural tourism, generating additional revenue.

3. **Digital Transformation:** Increasing digital public services could improve accessibility, streamline administration, and attract younger residents interested in tech-based services.

4. **Cross-Regional Collaborations:** Partnerships with neighboring municipalities can share resources for transportation, healthcare, and public services, benefiting regional development.

3. **Inflation and Rising Costs:** Increasing construction, maintenance, and energy costs can hinder the municipality’s ability to meet its goals within budget.

4. **Outmigration of Young People:** The trend of young people moving to urban centers or abroad limits the municipality’s workforce and economic growth potential.

Summary: This SWOT-analysis captures Gulbene’s strengths in infrastructure and community initiatives, while identifying challenges in demographics and budget limitations. Opportunities for growth exist in green projects and tourism, but environmental and economic dependencies present notable risks.

**Kraslava County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Natural and Cultural Richness:</b> Krāslava boasts unique natural sites, including parks, lakes, and protected landscapes, which attract tourists and contribute to a strong sense of local identity.</p> <p>2. <b>Community Engagement:</b> The municipality involves residents in planning and development, particularly through support for local associations and community projects.</p> <p>3. <b>Strategic Infrastructure Projects:</b> Investments in infrastructure, including roads, public facilities, and environmental improvements, are enhancing Krāslava’s appeal and quality of life.</p> <p>4. <b>Educational and Social Support Programs:</b> Significant investment in education and social services ensures support for families, children, and individuals with special needs.</p>	<p>1. <b>Population Decline and Aging Demographics:</b> Krāslava faces a declining population and an aging demographic, impacting the workforce and increasing demand for healthcare services.</p> <p>2. <b>High Unemployment Rate:</b> The municipality has a higher-than-average unemployment rate, particularly affecting economically active residents.</p> <p>3. <b>Dependency on Key Sectors:</b> Heavy reliance on traditional industries, such as agriculture and local trade, limits economic diversity and resilience.</p> <p>4. <b>Rural Infrastructure Needs:</b> Maintaining and upgrading infrastructure across rural areas remains challenging, impacting access to services for more isolated residents.</p>
Opportunities	Threats
<p>1. <b>Tourism Development:</b> Expanding eco-tourism and cultural tourism, given Krāslava’s natural beauty and historical sites, could boost the local economy and create jobs.</p> <p>2. <b>Green and Sustainable Projects:</b> Leveraging EU funds for green energy and sustainability initiatives can promote economic resilience and reduce environmental impact.</p> <p>3. <b>Cross-Municipal Collaborations:</b> Partnerships with neighboring municipalities could enhance shared</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Risks such as flooding and severe weather pose threats to infrastructure and agriculture, requiring adaptation.</p> <p>2. <b>Economic Dependency on Limited Sectors:</b> Dependency on agriculture and local trade makes Krāslava vulnerable to market fluctuations in these sectors.</p> <p>3. <b>Rising Costs and Inflation:</b> Increased construction and energy costs strain the budget and can delay essential projects .</p>

services, improve transportation, and strengthen regional development.

**4. Digital Transformation of Services:** Increasing digital services for residents can improve accessibility, streamline processes, and attract tech-focused residents.

**4. Youth Outmigration:** Young people moving to urban centers or abroad for better opportunities limits workforce availability and challenges long-term economic sustainability.

Summary: This SWOT-analysis highlights Krāslava's strengths in natural resources and community initiatives while addressing challenges in demographics and economic dependency. Opportunities in tourism and green initiatives offer growth potential, with climate risks and economic dependency presenting notable challenges.

**Kuldīga County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>UNESCO Recognition:</b> Kuldīga’s old town is listed as a UNESCO World Heritage Site, which enhances its cultural value and tourism potential.</p> <p>2. <b>Community-Centered Initiatives:</b> The municipality promotes active citizen involvement through projects like the "Darīsim paši" initiative, where residents participate in local improvement efforts.</p> <p>3. <b>Growing Infrastructure and Service Accessibility:</b> Investments in infrastructure, including new social service centers and education facilities, improve residents' quality of life and access to services.</p> <p>4. <b>Support for Local Business Growth:</b> Kuldīga supports entrepreneurship with co-financing projects for startups and has seen new businesses emerge in sectors like meat processing and woodworking.</p>	<p>1. <b>Aging Population and Demographic Decline:</b> Kuldīga faces a decreasing population and an aging demographic, affecting labor availability and increasing social service demands.</p> <p>2. <b>Limited Budget for Expansive Projects:</b> Although financial resources are carefully managed, there are limitations on funding large-scale projects independently.</p> <p>3. <b>Seasonal Tourism Dependency:</b> The municipality’s tourism sector is somewhat seasonal, impacting year-round economic stability.</p> <p>4. <b>Rural Infrastructure Needs:</b> Maintaining infrastructure in rural areas remains challenging, especially with limited funding.</p>
Opportunities	Threats
<p>1. <b>Eco-Tourism and Sustainable Development:</b> Opportunities exist to promote eco-tourism leveraging Kuldīga’s natural and cultural heritage, especially around UNESCO sites.</p> <p>2. <b>EU Funding for Green Initiatives:</b> The municipality can access EU funds to invest in sustainable projects, including renewable energy and energy-efficient public infrastructure.</p> <p>3. <b>Digital Transformation of Services:</b> Expanding digital services can improve administrative efficiency and accessibility for residents, especially in remote areas.</p> <p>4. <b>Enhanced Regional Collaboration:</b> Partnerships with nearby municipalities</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Threats such as flooding and other extreme weather events pose risks to Kuldīga’s infrastructure and agricultural sectors.</p> <p>2. <b>Economic Sensitivity to Global Market Shifts:</b> Economic dependency on specific sectors makes the local economy vulnerable to global market fluctuations.</p> <p>3. <b>Rising Costs and Inflation:</b> Increasing costs of energy, materials, and services impact the municipality's ability to sustain projects within budget constraints.</p>

can foster resource sharing, especially in areas like tourism and public services.

4. **Youth Outmigration:** Migration of younger residents to urban centers or abroad limits the local workforce and economic growth potential.

Summary: This SWOT-analysis captures Kuldīga's unique cultural strengths and active community involvement, with challenges in demographic decline and budget limitations. Opportunities in sustainable tourism and digital transformation are promising, while environmental risks and economic dependencies are notable threats.

**Livani County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Community-Oriented Development:</b> Līvāni is dedicated to involving its residents through community projects and initiatives, creating a supportive environment for local needs.</p> <p>2. <b>Progressive Infrastructure Enhancements:</b> Recent upgrades in transportation, green spaces, and public facilities improve accessibility and quality of life, making Līvāni an attractive place for residents and businesses.</p> <p>3. <b>Youth and Family-Friendly Policies:</b> Recognized as a family-friendly workplace and named “Latvia’s Youth Capital” for 2024, Līvāni prioritizes youth engagement and family support.</p> <p>4. <b>Economic Support for Local Businesses:</b> Programs supporting small and medium enterprises, such as grants and business competitions, encourage local entrepreneurship and economic growth.</p>	<p>1. <b>Aging Population and Decline in Youth Retention:</b> The municipality faces challenges with population decline and an aging demographic, which impacts workforce availability and long-term economic growth.</p> <p>2. <b>Financial Limitations for Large-Scale Projects:</b> Budget constraints limit the municipality’s ability to fund extensive projects independently, especially in rural areas.</p> <p>3. <b>Heavy Dependence on State and EU Funding:</b> Significant reliance on external funds for development and green initiatives may affect project sustainability.</p> <p>4. <b>Economic Vulnerability Due to Limited Industry Diversity:</b> The economy is largely reliant on specific sectors, increasing its vulnerability to market shifts and sector-specific downturns.</p>
Opportunities	Threats
<p>1. <b>Growth in Tourism and Recreation:</b> Leveraging Līvāni’s natural and cultural assets for tourism can attract visitors and stimulate economic activity.</p> <p>2. <b>EU Funding for Sustainability Projects:</b> The municipality can further enhance green initiatives and eco-friendly infrastructure by securing EU funds.</p> <p>3. <b>Digitalization and E-Governance:</b> Expanding digital services for residents</p>	<p>1. <b>Climate Change and Environmental Risks:</b> Flooding and other environmental challenges impact local infrastructure, agriculture, and tourism, demanding adaptive measures.</p> <p>2. <b>Economic Sensitivity to Market Changes:</b> Reliance on certain economic sectors makes Līvāni susceptible to downturns in those industries.</p> <p>3. <b>Rising Costs and Inflation:</b> Increased costs for materials and energy strain the</p>

can improve accessibility and make public administration more efficient.

4. **Regional Collaboration:** Building partnerships with nearby municipalities may enable shared resources, especially in education, healthcare, and infrastructure.

municipal budget and may delay essential projects.

4. **Youth Outmigration:** The trend of young people moving to urban centers or abroad poses a challenge to sustaining a local skilled workforce.

Summary: This SWOT-analysis highlights Līvāni's strengths in community engagement and infrastructure development, while identifying challenges in demographics and budget constraints. Opportunities in tourism and digital transformation provide growth potential, with climate risks and economic dependency as notable threats.

**Ludza County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Rich Cultural Heritage:</b> Ludza municipality has invested in preserving historical sites, such as the medieval castle ruins, enhancing local cultural value and attracting tourists.</p> <p>2. <b>Strong Community Engagement:</b> Programs like the "12 Hours for Development" open house event and support for local youth and entrepreneurs foster active community participation and economic growth.</p> <p>3. <b>Infrastructure Improvements:</b> Upgrades to roads, parks, and street lighting in Ludza and Kārsava improve the quality of life and mobility for residents.</p> <p>4. <b>Social and Educational Support:</b> Investments in social services, youth employment programs, and educational resources enhance community welfare and access to education.</p>	<p>1. <b>Demographic Challenges:</b> Ludza faces an aging population and population decline, limiting workforce availability and increasing social service demands.</p> <p>2. <b>Budgetary Constraints:</b> Limited financial resources restrict the ability to fund major projects independently, leading to reliance on state and EU funding.</p> <p>3. <b>Dependence on External Funding for Development:</b> Financial dependency on external sources, such as the EU, for significant projects, can affect long-term sustainability.</p> <p>4. <b>Infrastructure Needs in Rural Areas:</b> The large rural area requires extensive maintenance and upgrades, which are challenging to fund and manage consistently.</p>
Opportunities	Threats
<p>1. <b>Tourism Expansion:</b> Leveraging historical and natural sites for eco-tourism and cultural tourism could boost the local economy and create jobs.</p> <p>2. <b>Green Development Initiatives:</b> EU funding for green projects offers potential for sustainable infrastructure improvements and environmental conservation.</p> <p>3. <b>Digital Transformation:</b> Expanding digital services can improve public service efficiency and accessibility for residents, particularly in remote areas.</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Threats such as flooding and extreme weather could impact infrastructure and agricultural productivity, necessitating adaptation strategies.</p> <p>2. <b>Rising Costs and Inflation:</b> Increased costs for energy, materials, and services impact the municipality's budget and may delay or limit projects.</p> <p>3. <b>Outmigration of Young People:</b> The trend of youth leaving for larger cities or abroad limits workforce availability and economic growth potential.</p>



**4. Enhanced Regional Partnerships:** Collaborations with neighboring municipalities may increase resource efficiency and enhance public services.

**4. Economic Sensitivity to Market Fluctuations:** Heavy reliance on specific sectors, like agriculture, makes the local economy vulnerable to market changes.

Summary: This SWOT-analysis highlights Ludza's cultural assets and infrastructure improvements while acknowledging demographic and budget challenges. Opportunities lie in tourism and sustainable development, with environmental risks and economic dependencies posing notable threats.

**Madona County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Entrepreneurship-Friendly Environment:</b> Madona was recognized as Latvia's "Most Business-Friendly Municipality," highlighting its efforts to support local businesses and provide grants for new ventures.</p> <p>2. <b>Supportive for Families and Youth:</b> Madona has policies such as free kindergarten and school meals, making it the most family-friendly municipality in the Vidzeme region.</p> <p>3. <b>Investment in Sports and Cultural Events:</b> The municipality hosts international sports competitions and cultural activities, enhancing its profile and tourism appeal.</p> <p>4. <b>Ongoing Infrastructure Development:</b> Projects like school modernization and recreational area improvements illustrate a strong focus on enhancing public infrastructure.</p>	<p>1. <b>Aging Population and Population Decline:</b> Demographic challenges with an aging and decreasing population affect the labor force and increase healthcare demands.</p> <p>2. <b>Financial Constraints on Large Projects:</b> Budget limitations prevent Madona from fully funding large-scale projects independently, necessitating external funding.</p> <p>3. <b>Dependence on Specific Economic Sectors:</b> The economy's reliance on traditional sectors like agriculture can limit diversification and resilience.</p> <p>4. <b>Seasonal Employment:</b> Job opportunities in tourism and agriculture fluctuate seasonally, affecting income stability for residents .</p>
Opportunities	Threats
<p>1. <b>Tourism and Eco-Tourism Expansion:</b> With unique natural and cultural resources, Madona can develop tourism further, attracting more visitors and stimulating economic growth.</p> <p>2. <b>EU Funds for Green Initiatives:</b> Opportunities to leverage EU funding for green energy and infrastructure improvements could benefit the local economy and environment.</p> <p>3. <b>Digital Transformation:</b> Expanding digital public services can improve administrative efficiency and accessibility for residents, especially in rural areas.</p>	<p>1. <b>Climate and Environmental Risks:</b> Flooding and other climate impacts threaten infrastructure and agriculture, requiring ongoing adaptation measures.</p> <p>2. <b>Economic Sensitivity to Market Changes:</b> Heavy reliance on specific sectors makes Madona vulnerable to economic fluctuations.</p> <p>3. <b>Rising Costs and Inflation:</b> Higher energy and material costs can strain the budget and hinder progress on essential projects.</p> <p>4. <b>Youth Outmigration:</b> The trend of young people moving to larger cities</p>

<b>4. Enhanced Regional Collaboration:</b> Partnerships with neighboring municipalities can optimize resource sharing, especially for transport, healthcare, and public services.	reduces the local skilled workforce and limits long-term growth potential.
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Summary: This SWOT-analysis emphasizes Madona’s strengths in community support and infrastructure development, while noting challenges in demographics and budgetary constraints. Opportunities for tourism and sustainability initiatives offer growth potential, with climate risks and economic dependency as notable threats.

**Preili County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Strong Community Engagement:</b> Preilji actively promotes community involvement with initiatives like the "participation budget" and advisory councils, ensuring residents have a voice in local decision-making.</p> <p>2. <b>Tourism and Cultural Development:</b> Investments in tourism, such as the renovation of historical sites and the launch of new tourist services, boost the local economy and attract visitors.</p> <p>3. <b>Support for Education and Youth:</b> The municipality offers extensive programs for students, from free school meals to international collaborations and grants, which enhance local educational opportunities.</p> <p>4. <b>Environmental and Infrastructure Improvements:</b> Preilji emphasizes sustainable development with projects focused on energy efficiency, infrastructure enhancements, and green initiatives.</p>	<p>1. <b>Aging Population and Workforce Shortages:</b> A declining and aging population challenges workforce availability and increases the burden on social services.</p> <p>2. <b>Financial Dependence on State and EU Funding:</b> Limited municipal resources necessitate reliance on external funds, making long-term project sustainability difficult.</p> <p>3. <b>Limited Economic Diversity:</b> Heavy dependence on specific sectors, like agriculture and local businesses, may limit resilience to economic fluctuations.</p> <p>4. <b>Maintenance Needs in Rural Areas:</b> Extensive rural infrastructure requires significant upkeep, which strains the budget and affects service delivery.</p>
Opportunities	Threats
<p>1. <b>Growth in Eco-Tourism and Cultural Tourism:</b> Preilji's natural landscapes and cultural sites present opportunities for further tourism development, attracting both domestic and international visitors.</p> <p>2. <b>Digital Service Expansion:</b> Increasing digital accessibility for municipal services can enhance efficiency and make resources more readily available for residents.</p> <p>3. <b>Green Energy Projects:</b> Leveraging EU funds to develop renewable energy</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Flooding and other climate-related threats pose risks to agriculture and infrastructure, necessitating adaptive strategies.</p> <p>2. <b>Economic Sensitivity to Market Changes:</b> Dependence on limited sectors makes the local economy vulnerable to downturns in these areas.</p> <p>3. <b>Youth Outmigration:</b> The trend of young residents leaving for larger cities reduces the local talent pool and impacts economic growth.</p>

projects and eco-friendly infrastructure can bolster environmental sustainability.

4. **Enhanced Inter-Municipal Collaboration:** Partnerships with neighboring municipalities could improve resource sharing and optimize services like transport and healthcare.

4. **Inflation and Rising Operational Costs:** Increased costs for energy and materials challenge the municipal budget and can hinder project implementation.

Summary: This SWOT-analysis emphasizes Preilji’s community engagement and tourism as key strengths while noting demographic and financial limitations. Opportunities for green and digital projects provide growth potential, with climate risks and economic dependency posing significant challenges.

**Rezekne County** (remote county, Cluster 5)

Strengths	Weaknesses
<p><b>1. Active Community Engagement:</b> The county promotes resident participation in local decision-making processes, fostering community cohesion and transparency.</p> <p><b>2. Cultural and Educational Support:</b> Investments in cultural initiatives, schools, and extracurricular activities enhance educational outcomes and preserve local cultural heritage.</p> <p><b>3. Strategic Geographic Location:</b> Rēzekne's proximity to the Latvian-Russian border provides strategic opportunities for cross-border trade and collaboration.</p> <p><b>4. Diverse Economic Activities:</b> The region supports various sectors such as agriculture, forestry, and manufacturing, contributing to economic resilience.</p>	<p><b>1. Aging Population and Population Decline:</b> The county faces demographic challenges with an aging population and youth outmigration, affecting workforce sustainability.</p> <p><b>2. Dependence on External Funding:</b> Rēzekne's budget relies heavily on state and EU funding, affecting financial independence and flexibility in long-term planning.</p> <p><b>3. Rural Infrastructure Maintenance Challenges:</b> Extensive rural areas require substantial infrastructure maintenance, posing logistical and budgetary constraints.</p> <p><b>4. Housing Limitations:</b> Limited affordable housing options may hinder population retention and attraction.</p>
Opportunities	Threats
<p><b>1. Eco-Tourism and Cultural Tourism Development:</b> Rēzekne's natural landscapes and cultural sites offer opportunities to develop eco-tourism and heritage tourism, enhancing the local economy.</p> <p><b>2. Green Energy Projects:</b> Access to EU funds for green energy initiatives allows for sustainable infrastructure development.</p> <p><b>3. Digitalization of Public Services:</b> Expanding digital services can improve administrative efficiency and service accessibility, especially in rural areas.</p> <p><b>4. Enhanced Regional Partnerships:</b> Collaborating with neighboring</p>	<p><b>1. Climate Change and Environmental Risks:</b> Flooding and extreme weather conditions pose risks to agriculture and infrastructure, necessitating adaptive measures.</p> <p><b>2. Economic Vulnerability to Market Changes:</b> Reliance on key sectors like agriculture and forestry makes the county sensitive to market fluctuations.</p> <p><b>3. Rising Operational Costs:</b> Increased costs of energy and materials strain the municipal budget, potentially affecting the viability of projects.</p> <p><b>4. Youth Outmigration:</b> The ongoing trend of young people leaving the area for urban centers or abroad reduces local talent</p>

municipalities can lead to improved shared services and resource optimization.	availability and limits long-term economic growth.
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Summary: This SWOT-analysis reflects Rēzekne’s strengths in community engagement and cultural investment, with challenges in demographics and budget reliance. Opportunities in tourism and green initiatives are promising, while environmental threats and economic dependencies present significant risks.

**Saldus County** (remote county, Cluster 5)

Strengths	Weaknesses
<p><b>1. Strategic Location and Connectivity:</b> Located close to major Latvian cities and bordering Lithuania, Saldus benefits from regional accessibility, supporting commerce and tourism.</p> <p><b>2. Diverse Economic Sectors:</b> Saldus has a mix of industries including energy production, metal manufacturing, and agricultural businesses, contributing to a resilient local economy.</p> <p><b>3. Strong Educational and Cultural Investments:</b> The municipality provides robust support for education, culture, and sports, including specialized schools and community centers, enhancing quality of life.</p> <p><b>4. Community Engagement and Supportive Programs:</b> Active community engagement and various support programs foster strong local ties and empower residents.</p>	<p><b>1. Population Decline and Aging Demographics:</b> Saldus faces challenges with an aging population and declining resident numbers, impacting workforce availability and social service demand.</p> <p><b>2. Limited Budget for Large-Scale Projects:</b> While financial resources are allocated efficiently, the budget limits funding for extensive infrastructure or new development projects.</p> <p><b>3. Dependency on State and EU Funding:</b> Significant reliance on external funding sources affects the long-term financial sustainability of municipal projects.</p> <p><b>4. Challenges in Rural Area Infrastructure Maintenance:</b> Maintaining and upgrading infrastructure in rural parts of the municipality is challenging due to budget constraints.</p>
Opportunities	Threats
<p><b>1. Expansion of Eco-Tourism and Cultural Tourism:</b> Saldus's location and natural landscapes provide growth potential in eco-tourism and cultural tourism, boosting the local economy.</p> <p><b>2. EU Funding for Green and Infrastructure Projects:</b> The municipality can continue leveraging EU funds to improve sustainability and infrastructure.</p> <p><b>3. Digital Transformation Initiatives:</b> Expanding digital public services can streamline administrative functions and improve access for residents, especially in remote areas.</p>	<p><b>1. Environmental Risks from Climate Change:</b> Flooding and other environmental threats can disrupt infrastructure and agriculture, requiring adaptation.</p> <p><b>2. Economic Vulnerability Due to Limited Sector Diversification:</b> Dependence on specific sectors like energy and agriculture can make the local economy vulnerable to market fluctuations.</p> <p><b>3. Increasing Costs and Inflation:</b> Rising costs for materials and energy strain the municipal budget, potentially delaying projects.</p>



**4. Cross-Border Collaboration with Lithuania:** Proximity to Lithuania opens opportunities for economic and cultural exchange, enhancing regional collaboration.

**4. Youth Outmigration:** The trend of young people leaving for larger cities or abroad limits the municipality’s long-term growth potential and workforce stability.

Summary: This SWOT-analysis underscores Saldus's strengths in strategic location and community initiatives, while highlighting challenges in demographics and budget. Opportunities lie in eco-tourism and digitalization, with environmental risks and economic dependencies as significant threats.

**Smiltene County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Economic Diversity:</b> Smiltene has a diverse economy supported by agriculture, forestry, woodworking, and manufacturing sectors, which contributes to economic stability.</p> <p>2. <b>Educational Investment:</b> The municipality has numerous educational institutions and offers broad support, such as school meal subsidies and transport services for students.</p> <p>3. <b>Active Community Engagement:</b> Smiltene emphasizes resident participation through public meetings and involvement in municipal planning, promoting a sense of community and collaboration.</p> <p>4. <b>Cultural and Sports Infrastructure:</b> Well-developed infrastructure, including cultural centers, libraries, sports facilities, and recreational trails, enhances the quality of life for residents.</p>	<p>1. <b>Aging Population and Declining Demographics:</b> The municipality faces challenges with an aging population and limited growth, which impacts workforce availability.</p> <p>2. <b>Heavy Reliance on External Funding:</b> There is significant dependence on state and EU funds, which affects the long-term financial sustainability of many projects.</p> <p>3. <b>Limited Housing Availability:</b> Insufficient affordable housing options may hinder population retention and economic development.</p> <p>4. <b>Infrastructure Gaps in Rural Areas:</b> Maintaining infrastructure across extensive rural areas is challenging and costly.</p>
Opportunities	Threats
<p>1. <b>Expansion of Eco-Tourism and Cultural Tourism:</b> Smiltene’s natural and cultural resources present opportunities to attract more visitors, which could bolster the local economy.</p> <p>2. <b>Green Initiatives and EU Funding:</b> Access to EU funds for green energy projects and sustainable infrastructure can support economic growth and environmental goals.</p> <p>3. <b>Digital Transformation of Public Services:</b> Expanding digital services can enhance efficiency in public</p>	<p>1. <b>Environmental Risks from Climate Change:</b> Risks such as flooding and extreme weather impact infrastructure and agriculture, necessitating adaptation strategies.</p> <p>2. <b>Economic Sensitivity to Market Changes:</b> Dependence on specific sectors, like forestry and agriculture, makes Smiltene vulnerable to fluctuations in those markets.</p> <p>3. <b>Rising Costs and Inflation:</b> Increasing costs for materials and energy pose challenges to the municipal budget and</p>

administration and improve service accessibility.	can delay or reduce project implementation.
4. <b>Strengthened Inter-Municipal Collaborations:</b> Partnerships with nearby municipalities can help share resources and optimize public services.	4. <b>Youth Outmigration:</b> The tendency for young people to relocate to larger urban areas or abroad limits the availability of skilled labor locally.

Summary: This SWOT-analysis highlights Smiltene’s strengths in community engagement and diverse economy, while acknowledging challenges with demographic changes and budget limitations. Opportunities lie in eco-tourism and green projects, with climate risks and economic dependencies as notable threats.

**Talsi County** (remote county, Cluster 5)

Strengths	Weaknesses
<p><b>1. Cultural and Historical Significance:</b> Talsi’s emphasis on cultural heritage, including the restoration of historic landmarks and dedication to preserving local traditions, enriches community identity and tourism appeal.</p> <p><b>2. Community Engagement and Transparency:</b> Initiatives like live-streaming council meetings and creating advisory councils promote resident involvement and government transparency.</p> <p><b>3. Infrastructure Investments:</b> Upgrades in educational facilities, public lighting, and road infrastructure contribute to improved quality of life and accessibility.</p> <p><b>4. Support for Social Services and Education:</b> Talsi prioritizes social welfare and educational support, including free school meals and expanded facilities for special needs groups.</p>	<p><b>1. Aging Population and Population Decline:</b> An aging demographic and overall population decline pose challenges for workforce sustainability and increase the burden on social services.</p> <p><b>2. Budgetary Constraints for Large Projects:</b> Limited financial resources restrict the municipality’s capacity to independently fund large-scale projects, leading to reliance on external funding.</p> <p><b>3. Delays in Development Projects:</b> Issues such as delays in school renovations and public facility upgrades have impacted project timelines, highlighting logistical challenges.</p> <p><b>4. Economic Dependence on Specific Sectors:</b> Reliance on tourism and local businesses for economic stability may limit economic resilience during downturns.</p>
Opportunities	Threats
<p><b>1. Enhanced Tourism and Cultural Development:</b> Continued development of historical sites and natural attractions can attract more visitors, benefiting the local economy.</p> <p><b>2. Green Initiatives and EU Funding:</b> Access to EU funds for sustainable projects allows Talsi to pursue green infrastructure and energy-efficient developments.</p> <p><b>3. Digital Transformation in Governance:</b> Expanding digital services can improve municipal efficiency and service accessibility for residents.</p>	<p><b>1. Environmental and Climate Risks:</b> The municipality faces threats such as flooding and other climate-related events that impact infrastructure and agriculture.</p> <p><b>2. Economic Sensitivity to Market Fluctuations:</b> The economy’s reliance on certain sectors makes it vulnerable to market changes, affecting stability.</p> <p><b>3. Rising Costs and Inflation:</b> Increased costs for energy and materials strain the municipal budget and can delay or reduce project scopes.</p> <p><b>4. Youth Outmigration:</b> The trend of young people relocating for</p>

4. **Collaborations with Neighboring**

**Regions:** Partnerships with nearby municipalities can optimize resource allocation and improve service delivery in shared areas like healthcare and public transport.

opportunities outside Talsi limits local talent and hampers long-term growth potential.

Summary: This SWOT-analysis highlights Talsi’s strengths in community engagement and infrastructure, balanced with challenges in demographics and funding limitations. Opportunities in tourism and sustainability are promising, while climate risks and economic dependencies remain significant concerns.

**Valka County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Cross-Border Collaboration:</b> Valka has a unique strategic advantage in its twin-city partnership with Valga, Estonia, facilitating cross-border initiatives in tourism, culture, and social services.</p> <p>2. <b>Community Engagement:</b> Valka encourages active resident participation through events, public meetings, and an emphasis on transparency.</p> <p>3. <b>Infrastructure for Tourism and Recreation:</b> Investment in cultural landmarks, sports facilities, and green spaces enhances the attractiveness of Valka as a tourist destination and improves the quality of life for residents.</p> <p>4. <b>Support for Local Entrepreneurship:</b> Programs aiding local businesses and agriculture foster economic development and job creation, particularly in sectors like forestry, agriculture, and small manufacturing.</p>	<p>1. <b>Aging Population and Outmigration:</b> Valka faces demographic challenges, including an aging population and the outmigration of young people, impacting labor availability.</p> <p>2. <b>Budgetary Constraints:</b> Limited financial resources restrict the municipality's ability to independently fund larger projects, making it dependent on external funding.</p> <p>3. <b>Insufficient Housing Options:</b> Limited availability of affordable housing may hinder population retention and attraction of new residents.</p> <p>4. <b>Economic Dependence on Specific Sectors:</b> The local economy's reliance on a few primary sectors like agriculture and forestry increases its vulnerability to market changes.</p>
Opportunities	Threats
<p>1. <b>Expansion of Eco-Tourism:</b> Leveraging natural and historical assets presents opportunities for eco-tourism development, attracting visitors and boosting the local economy.</p> <p>2. <b>EU Funding for Sustainable Projects:</b> Access to EU grants allows Valka to pursue green initiatives, infrastructure improvements, and community projects.</p> <p>3. <b>Digital Transformation:</b> Expanding digital services can improve administrative efficiency and accessibility for residents, especially those in rural areas.</p>	<p>1. <b>Environmental Risks:</b> Climate-related issues, such as flooding, could threaten infrastructure and agricultural productivity, requiring adaptive strategies.</p> <p>2. <b>Economic Sensitivity to Market Fluctuations:</b> Dependence on certain sectors makes Valka vulnerable to economic shifts that could impact employment and revenue.</p> <p>3. <b>Rising Costs and Inflation:</b> Increased costs for materials and energy strain the municipal budget, potentially affecting project viability.</p>

**4. Inter-Municipal Collaborations:** Strengthened partnerships with neighboring regions can enhance shared services and resource allocation, particularly in healthcare and public services.

**4. Youth Outmigration:** The trend of young residents leaving for urban areas reduces the availability of skilled labor and limits long-term growth potential.

Summary: This SWOT-analysis underscores Valka’s strengths in cross-border collaboration and community initiatives, while addressing demographic and economic challenges. Opportunities lie in tourism and green development, with climate risks and economic dependencies posing significant threats.

**Varaklani County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Community Involvement and Transparency:</b> Varaklāni has active community engagement through public meetings, local events, and transparent communication, which fosters a sense of community and trust.</p> <p>2. <b>Cultural and Educational Programs:</b> Investment in educational facilities, music and arts schools, and various cultural programs reflects a strong commitment to supporting youth and promoting cultural identity.</p> <p>3. <b>Local Business Support:</b> Initiatives to support local businesses and entrepreneurship contribute to economic resilience, especially in the areas of agriculture and small enterprises.</p> <p>4. <b>Social Services and Healthcare:</b> Varaklāni provides comprehensive social support and healthcare services, such as home care for the elderly and facilities for special needs.</p>	<p>1. <b>Aging Population and Demographic Decline:</b> A declining and aging population limits workforce availability and increases pressure on social and healthcare services.</p> <p>2. <b>Budget Dependence on External Funding:</b> The municipality relies on state and EU funds for major projects, affecting long-term financial stability and limiting autonomous development.</p> <p>3. <b>Limited Housing Options:</b> There is a shortage of affordable housing, which may hinder efforts to attract new residents and retain current ones.</p> <p>4. <b>Rural Infrastructure Challenges:</b> Maintenance and upgrades for rural infrastructure are costly and complex due to the extensive geographic area of the municipality.</p>
Opportunities	Threats
<p>1. <b>Tourism Development:</b> The municipality's natural and cultural resources present opportunities for expanding eco-tourism and heritage tourism, which can stimulate the local economy.</p> <p>2. <b>Green and Digital Initiatives:</b> Leveraging EU funds for sustainable energy projects and expanding digital services can enhance infrastructure and environmental sustainability.</p>	<p>1. <b>Climate and Environmental Risks:</b> Flooding and extreme weather events pose significant risks to local agriculture and infrastructure.</p> <p>2. <b>Economic Sensitivity to Market Fluctuations:</b> Dependence on specific sectors like agriculture makes the economy vulnerable to market changes.</p> <p>3. <b>Inflation and Rising Operational Costs:</b> Increased costs for materials and energy</p>



**3. Collaborations with Neighboring Municipalities:**

Partnerships with surrounding regions can optimize resource-sharing and improve services such as transport and healthcare.

**4. Support for Local**

**Entrepreneurship:** Encouraging new businesses and supporting existing ones can diversify the economy and reduce dependency on specific sectors.

challenge the municipal budget, potentially impacting project timelines.

**4. Youth Outmigration:** The trend of young residents leaving for urban centers or abroad limits local talent and affects long-term economic growth.

Summary: This SWOT-analysis highlights Varakļāni’s strengths in community support and cultural engagement, balanced by challenges in demographics and financial reliance. Opportunities lie in tourism and green development, while environmental risks and economic dependencies remain significant threats.

**Ventspils County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Strategic Coastal Location:</b> Ventspils has access to a long Baltic Sea coastline, making it favorable for tourism and maritime activities.</p> <p>2. <b>Economic Sector Diversity:</b> The municipality has strengths in forestry, agriculture, fishing, and tourism, contributing to a stable economic base.</p> <p>3. <b>Community Engagement and Transparency:</b> Ventspils encourages resident involvement through public events and transparent communication, fostering strong community relations.</p> <p>4. <b>Focus on Education and Culture:</b> Investments in educational facilities, cultural activities, and community projects enhance the quality of life for residents and promote cultural engagement.</p>	<p>1. <b>Aging Population and Population Decline:</b> Ventspils faces a declining and aging population, which impacts workforce availability and social service demands.</p> <p>2. <b>Heavy Reliance on External Funding:</b> The municipality relies significantly on state and EU funds for major projects, affecting financial independence.</p> <p>3. <b>Limited Housing Options:</b> Shortages in affordable housing can limit efforts to attract new residents or retain younger demographics.</p> <p>4. <b>Challenges in Rural Infrastructure Maintenance:</b> The extensive rural areas require substantial resources for infrastructure upkeep, presenting budgetary challenges.</p>
Opportunities	Threats
<p>1. <b>Growth in Eco-Tourism and Maritime Tourism:</b> Ventspils' natural and coastal resources provide opportunities to develop tourism, which could boost the local economy.</p> <p>2. <b>EU Funding for Green and Infrastructure Projects:</b> Leveraging EU funds for sustainable and infrastructural development aligns with economic growth and environmental objectives.</p> <p>3. <b>Digital Transformation of Public Services:</b> Expanding digital services can improve municipal efficiency and accessibility for residents, especially in rural areas.</p>	<p>1. <b>Environmental Risks and Climate Change:</b> Coastal areas face increased risk of flooding and extreme weather, which could impact local infrastructure and agriculture.</p> <p>2. <b>Economic Sensitivity to Market Changes:</b> The economy's dependence on key sectors like agriculture and forestry makes it vulnerable to market fluctuations.</p> <p>3. <b>Rising Costs and Inflation:</b> Increasing costs for materials and energy pose challenges for the municipal budget and may delay project implementation.</p> <p>4. <b>Youth Outmigration:</b> The trend of young residents moving to larger cities or</p>

4. **Collaborations with Neighboring**

**Regions:** Partnerships with adjacent municipalities can improve resource-sharing and optimize public services, particularly in healthcare and public transport.

abroad limits the available workforce and hinders long-term growth.

Summary: This SWOT-analysis highlights Ventspils’ strengths in strategic location and community engagement, while also noting challenges with demographics and budgetary reliance. Opportunities lie in eco-tourism and digital initiatives, with climate risks and economic dependencies as significant threats.

**Yekabpils County** (remote county, Cluster 5)

Strengths	Weaknesses
<p>1. <b>Robust Infrastructure Development:</b> Jēkabpils has focused on infrastructure upgrades, including road networks, public parks, and waste management systems, improving residents' quality of life.</p> <p>2. <b>Active Community Engagement:</b> The municipality involves citizens in decision-making through public consultations and a participatory budget process, fostering strong community ties.</p> <p>3. <b>Diverse Educational and Cultural Programs:</b> Jēkabpils invests in education and cultural activities, including support for schools, vocational training, and cultural events, strengthening its social fabric and supporting lifelong learning.</p> <p>4. <b>Environmental Initiatives:</b> Efforts in energy efficiency and waste reduction showcase Jēkabpils's commitment to sustainability and align with Latvia's green initiatives.</p>	<p>1. <b>Budget Constraints:</b> Limited financial resources impact the municipality's ability to expand services and complete infrastructure projects, particularly in rural areas.</p> <p>2. <b>Demographic Challenges:</b> The municipality faces population decline and an aging demographic, affecting workforce availability and increasing demands for social services.</p> <p>3. <b>Dependence on Key Industries:</b> Jēkabpils's economy relies heavily on agriculture and trade, limiting diversification and resilience against economic shifts.</p> <p>4. <b>Rural Infrastructure Needs:</b> Remote areas face challenges with aging infrastructure, affecting accessibility and quality of life for residents outside the urban center.</p>
Opportunities	Threats
<p>1. <b>EU Funding for Green Projects:</b> Access to EU grants for renewable energy and sustainability projects could help Jēkabpils enhance its eco-friendly infrastructure.</p> <p>2. <b>Tourism Development:</b> With its cultural heritage and scenic landscapes, the municipality has the potential to attract tourists, which would stimulate local businesses and generate additional revenue.</p> <p>3. <b>Digital Transformation:</b> Expanding digital services could streamline administrative processes, increase</p>	<p>1. <b>Climate Change and Environmental Risks:</b> Risks such as flooding, which has previously impacted Jēkabpils, threaten local infrastructure and necessitate costly adaptive measures.</p> <p>2. <b>Economic Dependency on Specific Sectors:</b> Reliance on agriculture and trade makes the local economy vulnerable to sector-specific downturns, impacting employment and revenue.</p> <p>3. <b>Rising Costs and Inflation:</b> Increasing costs for materials and services can</p>

accessibility, and attract younger, tech-savvy residents.

4. **Regional and International Collaborations:** Partnerships with nearby municipalities and international entities can bolster resources, improve services, and enhance Jēkabpils’s competitiveness.

hinder planned projects and strain the municipality’s budget.

4. **Outmigration:** Young people often leave for urban centers or abroad, which exacerbates workforce shortages and impacts long-term economic growth.

Summary: This SWOT-analysis highlights Jēkabpils’s strengths in infrastructure and community engagement, alongside challenges in budget constraints and demographic trends. Opportunities lie in green initiatives and tourism, while climate risks and economic dependency present notable threats.

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Izdevējdarbības reģistr. apliecība Nr. 2-0197.  
Vienības iela 13, Daugavpils, LV-5401, Latvija.  
Iespiests SIA "Drukātava"