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DEVELOPMENT STRATEGY OF THE LODZKIE REGION 2030

The Development Strategy of the Lodzkie Region 2030 is an Appendix to the Resolution No. XXX/414/21 of **the Regional Assembly of the Lodzkie Region**, dated 6 May 2021.

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I. INTRODUCTION

A regional development strategy is the most important document of a regional self-government, defining the vision and objectives of the regional policy in the economic, social, and spatial dimensions, as well as the actions necessary to achieve these objectives. The ***Development Strategy of the Lodzkie Region 2030*** is a response of the regional authorities to the changing conditions and challenges, and as such it presents a coherent plan of interrelated and well-thought-out actions in the perspective of the coming decade, providing a starting point for a broad cooperation that will result in raising the quality of life of the residents of the Lodzkie Region.

Planning the region's development is a continuous, fluid and dynamic process, which means that the creation of a new strategy is based both on the currently valid development strategy and the changing external conditions. Evaluating the implementation of the previously planned actions, and taking into consideration the current conditions help define new premises for planning a regional development policy.

The approaching end of the validity period of the Development Strategy of the Lodzkie Region 2020 (Strategy 2020), adopted by the Regional Assembly of the Lodzkie Region in 2013, provided a starting point for the drafting of a new document. The conclusions from the monitoring of the Strategy 2020 implementation and those drawn from the evaluation conducted in 2017[1] indicate progress in improving the transport accessibility of the region and its economic development. With respect to the social pillar, progress was shown in the development of social capital, improving access to public services, and reducing social inequalities.

One important conclusion of the evaluation is the timeliness of the challenges formulated in the Strategy 2020. The following are still important for the development of the region: improving the competitiveness and innovation of the regional economy, preventing depopulation, and accumulating creative human capital. It is also essential to ensure good health of the region's residents, as well as to adapt and expand its medical care and social assistance infrastructure, along with the scope of services to address the needs of the elderly. Among the challenges, the improvement of air quality is also emphasized.

From the perspective of a region operating within the framework of development policy conducted at the national level, the adoption of the **Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030)**[2] (SRD)—which served as the medium-term national development strategy—and the adoption of the **National Strategy of Regional Development 2030**[3] were of crucial importance. The guidelines for development outlined in those documents, and the priorities indicated therein, constitute a framework for action for the regional self-government in the context of maintaining a coherent development of the whole country.

An important determinant in the process of creating a new strategy, the one that affects the formulation of objectives and guidelines for intervention, is tied to the **objectives of the European Union's cohesion policy for the period 2021-2027**. After 2020, it is assumed that there will be a greater concentration of resources allocated for innovation, supporting small businesses, digital technologies, and industrial modernisation. Priority will also be given to the transition to low-carbon circular economy and to countering climate change.

Particularly important in the context of the region's economic structure are the new conditions resulting from the cohesion policy objective related to the transition towards a climate-neutral economy, which is directly related to the **restructuring processes in the mining and energy sectors.**

The *Development Strategy of the Lodzkie Region 2030 (Strategy 2030)* is coherent with the objectives laid out in the aforementioned documents. It was drafted using a classical approach and contains all obligatory elements resulting from statutory requirements. It plays a coordinating role for other programming and planning documents drafted at the regional level.

An integral part of the Development Strategy of the Lodzkie Region 2030 is the **regional social policy strategy.**[4]

[1] "Mid-term evaluation of the Development Strategy of the Lodzkie Region 2020 - final report on the study," Łódź, November 2017.
[2] Document adopted by Resolution No. 8 of the Council of Ministers of 14 February 2017. (Official Gazette of the Republic of Poland 2017, item 260).
[3] Document adopted by Resolution No. 102 of the Council of Ministers of September 17, 2019. (Official Gazette of the Republic of Poland 2019, item 1060).
[4] Provision resulting from Article 21 of the Social Assistance Act dated 12 March 2004 (Journal of Laws of 2019, item 1507, as amended). The current document is the Development Strategy of the Lodzkie Region 2020, as the development of the Regional Strategy for Social Policy 2030 is being finalized. Its main goal is to improve the quality of life in the region and ensure equal access of its residents to development opportunities.

Strategy 2030 is a response to the **internal and global challenges faced by the Lodzkie Region**. Actions undertaken under the Strategy will serve to mitigate the adverse effects of demographic processes related to depopulation and the aging of society, while also increasing innovation and competitiveness of the region's economy, including its transition towards Industry 4.0. The development of digitalisation and the entire e-services sector will be a pre-condition for these transformations. To ensure social cohesion, actions will be taken to increase access to high quality services in the fields of healthcare, social policy, education, culture, sports and tourism. Comprehensive improvement of accessibility of the region will be conducive to building territorial cohesion. Actions related to climate change adaptation and air quality improvement will also be extremely important. The Lodzkie Region recognizes the potential of the energy sector, as well as the need for its transformation. **Just and inclusive transition** strives to create a new model of development for the region's mining area while preventing it from economic and social regression.

2020 brought a completely new challenge related to the **mitigation of the effects of the crisis caused by the COVID-19 pandemic**. The Board of the Lodzkie Region has taken decisive actions to rebuild the economy and counter the increasing rate of unemployment. In order to prevent and limit the impact of the possible future threats, it is extremely important to continue the actions taken to date, among others in the area of healthcare and development of digitalisation, including the development of digital literacy of all social groups.

The actions proposed in the Strategy 2030 focus on counteracting negative phenomena and strengthening the internal potential of the region. The **territorial dimension of the intervention** will continue, adapted to the needs and development opportunities of respective territories, including the **Areas of Strategic Intervention** identified from the national and regional level. Concentration of interventions in these areas will streamline the **equalisation of development opportunities of individual areas of the region** and improve its territorial cohesion.

The axis of actions will be delineated by the best possible use of all available resources**. Special interest in the regional self-government strategy will be paid to the family and the creation of decent living conditions for all the inhabitants of the Lodzkie Region.**

The mode of work on the Strategy 2030 was determined by social aspects and experts' opinions. The consultation process was conducted twice: at the turn of 2019/2020 and again in early 2021. When drafting the document, the authors ensured the participation of representatives of local governments of different levels, social and economic partners, non-governmental organisations involved in the development policy of the region. Members of the Regional Territorial Forum were also included in the consultation process. To ensure objective evaluation of the proposed solutions and substantive support, academic experts representing the University of Lodz were involved in the works on the Strategy. The current version of the document takes into account all reasonable conclusions and recommendations made during the consultations and drafting of the document.

In addition, the draft Strategy was evaluated in the framework of the conducted ex-ante evaluation. The conclusions of the study indicate a positive assessment of the document both in terms of meeting the formal and legal conditions, as well as the set objectives and planned measures, which respond to the challenges facing the region in the coming decade.

The extensive process of public participation made it possible to draft a document that would respond to the development needs of the Lodzkie Region, ensure sustainable development of the region, improve the quality of life of its inhabitants, while respecting the values of the environmental and cultural assets.

Legal and programmatic considerations

Legal basis for the development of the Strategy

Pursuant to Article 11 Sections 1 and 2 of the Act on Regional Self-Government[5] dated 5 June 1998 and Article 3 of the Act on the Principles of Development Policy dated 6 December 2006,[6] **the regional self-government is responsible for creating development policies at the regional level,** and the primary tool for conducting these policies is the regional development strategy.

The legal basis for the development of the new strategy is the Resolution No. LV/680/18 of the Regional Assembly of the Lodzkie Region dated 28 August 2018 on defining the principles, procedure and schedule for the formulation of the Development Strategy of the Lodzkie Region 2030, with subsequent amendments.[7]

Key programmatic considerations arising from international and national strategic documents

The 2030 Agenda for Sustainable Development was adopted by the United Nations General Assembly on September 25, 2015. The Agenda identifies 17 Sustainable Development Goals ensuring a balance between three aspects (economic, social, and environmental). According to the 2030 Agenda, the current modernisation efforts should focus on eradicating poverty in all its forms while achieving economic, social, and environmental goals.

European Union Cohesion Policy 2021-2027

In its draft General Regulation of 29 May 2018,[8] the European Commission identified **5 Cohesion Policy Objectives** supported by the ERDF, ESF+ and CF[9] in the 2021-2027 perspective. In addition, a new financial instrument under the Cohesion Policy to provide support to areas facing severe socio-economic challenges resulting from the transition towards climate neutrality is the Just Transition Fund (JTF).[10] The draft Partnership Agreement (January 2021) **identifies an additional objective** that enables citizens and regions to mitigate the social, economic, and environmental and spatial impact of the transition towards a climate-neutral economy.

1. **A more competitive and smarter Europe,** by promoting innovative and smart economic transformation.
2. **A greener, low-carbon Europe.**
3. **A more connected Europe** - mobility and regional ICT connections.
4. **A more social Europe** - implementing the European Pillar of Social Rights.
5. **A Europe closer to citizens** - sustainable and integrated development of urban, rural, and coastal areas through local initiatives.
6. **Enabling regions and citizens to mitigate the social, economic, and environmental impacts of the transition towards a climate-neutral economy.**

The European Green Deal (EU Green Deal) is the EU's comprehensive strategy for protecting the environment and countering climate change. Announced in December 2019, the Green Deal aims to make the EU economy more sustainable. By 2050, Europe aspires to be the world's first climate-neutral continent, in line with the Paris Agreement. Along with climate neutrality, the main goal is to protect human life and animal and plant life while supporting the energy transition towards clean technologies. The basic assumptions of the document include a pollution-free Europe, transition to a closed-loop economy, implementation of the farm-to-table program, a green Common Agricultural Policy, adoption of the Just Transition Mechanism, sustainable transport, protection of

[5] Journal of Laws of 2020, item 1668, as amended.
[6] Journal of Laws 2019, item 1295, as amended.
[7] Amended by Resolution No. III/44/19 of the Regional Assembly of the Lodzkie Region dated 29 January 2019, Resolution No. XV/255/20 of the Regional Assembly of the Lodzkie Region dated 28 January 2020, and Resolution No. XX/301/20 of the Regional Assembly of the Lodzkie Region dated 15 September 2020.
[8] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the common provisions on the European Regional Development Fund, European Social Fund Plus, Cohesion Fund, Just Transition Fund, and the European Maritime and Fisheries Fund, along with the financial rules for these Funds and for the Asylum and Migration Fund, Internal Security Fund, and the Border and Visa Management Instrument. COM(2020) 23 final. 2018/0196 (COD).
[9] ERDF - European Regional Development Fund, ESF+ - European Social Fund Plus, CF - Cohesion Fund.
[10] Draft Regulation of the European Parliament and of the Council establishing the Fund for equitable transition of 14 January 2020.

European natural capital (EU Biodiversity Strategy), support for scientific research and stimulation of climate innovation. Another vital objective entails protecting citizens from climate change and preventing social exclusion by providing jobs for those at risk of losing them due to macroeconomic changes.[11]

Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030) (SRD), adopted by the Council of Ministers on 14 February 2017, identifies the following as its main objective: "Creating conditions for increasing incomes of Polish citizens along with increasing cohesion in the social, economic, environmental, and territorial dimensions". The strategy defined a new model of development: responsible and socially and territorially sustainable development. At the same time, it pointed to the regional self-government as the initiator, coordinator and mentor of development activities in the region carried out in an integrated way in the territorial system. The implementation of the main objective is supported by three specific objectives:

1. Sustainable economic growth increasingly driven by knowledge, data and organisational excellence.
2. Socially sensitive and territorially sustainable development.
3. Effective state and institutions contributing to growth as well as social and economic inclusion.

National Strategy for Regional Development 2030 (NSRD 2030), adopted by the Council of Ministers on 17 September 2019. The NSRD 2030 is one of nine integrated strategies and expands the provisions of the Strategy for Responsible Development (SRD), set out in the pillar: Socially sensitive and territorially sustainable development.

Fig. 1. Medium-sized cities losing socio-economic functions indicated in the NSRD after updating the delimitation of medium-sized cities losing socio-economic functions in 2018.

Source: own compilation based on materials provided by the Ministry of Development Funds and Regional Policy.

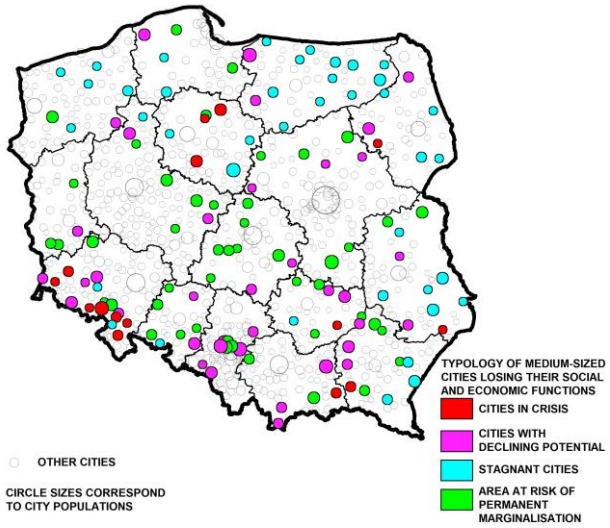
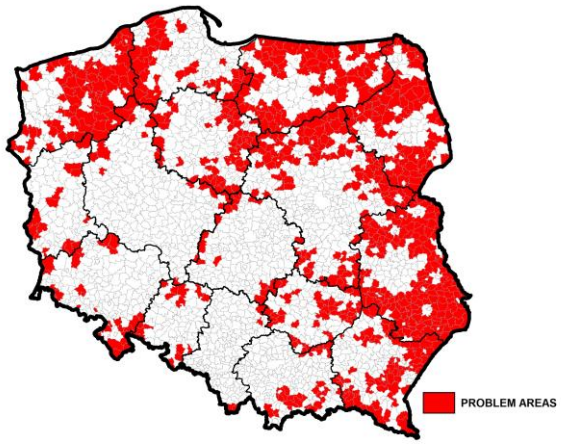


Fig. 2. Areas at risk of permanent marginalisation indicated in the NSRD as of the 2018 update on the delimitation of problem areas.
Source: own compilation based on materials provided by the Ministry of Development Funds and Regional Policy



The main objective of the regional policy is an effective use of endogenic potentials of the respective territories and their specialisations for the achievement of a sustainable development of the country, which will create conditions for the growth of income of the inhabitants of Poland with a simultaneous achievement of cohesion in the social, economic, environmental and spatial dimension. The main objective is developed by means of three specific objectives:

1. Increasing the cohesion of the country's social, economic, environmental, and spatial development.
2. Strengthening regional competitive advantages.
3. Improving the quality of management and implementation of territorially-targeted policies.

[11] Communication from the Commission to the European Parliament, the European Council, the Council, the Economic and Social Committee, and the Committee of the Regions. European Green Deal. Brussels, 11 December 2019. COM(2019) 640 final.

The Concept for the preparation and implementation of the Centralny Port Komunikacyjny (CPK) - Solidarity Transport Hub Poland (STH) investment, adopted by the Council of Ministers on 7 November 2017, does not constitute a development program, but is an expansion of the provisions of the SRD within the scope of an investment that represents a significant development impulse. The concept indicates the STH as a new hub airport, which is also the center of a new transport system in the country, integrating rail, air, and road transport. In addition to the main investment in the construction of the airport and the transport hub, the concept provides for the implementation of accompanying investments, i.e. the construction of new railway lines (e.g. high-speed Warsaw - Łódź- Wrocław/Poznań railway, allowing fast regional traffic), the extension of the A2 motorway on the Warsaw – Łódź section, and the construction of the Warsaw Agglomeration Ring Road. Economic activities closely related to the STH project, including those affecting the integration of Łódź and Warsaw, include the creation of a High Tech City (business parks), a trade fair and an exhibition center, along with a campus for Polish universities. The plan also provisions the implementation of development programs related to national heritage and revitalisation of urbanised areas, including Łódź. Complementary projects include the development of the Łódź Railway Node system, revitalisation, modernisation, and extension of the Łódź suburban tramway system, reconstruction of the Łódź Kaliska station, and construction of the Park&Ride system.[12]

The **Strategy for Sustainable Transport Development until 2030** adopted by the Council of Ministers on 24 September 2019 identifies **increasing transport accessibility and improving the safety of traffic participants and the efficiency of the transport sector through the development of a coherent, sustainable, innovative and user-friendly transport system in the national, European and global dimension** as the main objective of the national transport policy, whose implementation until 2030 has been provisioned in the form of six guidelines for intervention[13] spanning all branches of transport and activities provided for areas of strategic intervention.[14]

The strategy also envisions the expansion and modernisation of road, rail and air transport infrastructure, improvement of the quality of public transport, implementation of innovations, e.g. with respect to increasing resilience to climate change and minimizing environmental pressure.

In the global and European dimension, the strategy takes into account increasing accessibility, among others as part of the Trans-European Transport Network (TEN-T) and strategic new infrastructural elements (including the Solidarity Transport Hub). In the national dimension, an increase in interregional transport accessibility was envisaged, in order to strengthen the territorial cohesion of the country. Strong emphasis was also placed on increasing accessibility within the respective regions, so as to improve the quality of connections between centers and their hinterland (sub-regional centers and rural areas). In the field of urban mobility, the strategy envisions the promotion of solutions supporting sustainable urban mobility integrating cities with their functional areas with the use of clean and energy-efficient vehicles, along with the implementation of intelligent transport systems, and the application of Sustainable Urban Mobility Plans.

The Energy Policy of Poland until 2040, adopted by the Council of Ministers on 2 February 2021, **strives to establish energy security while ensuring the competitiveness of the economy, energy efficiency, and the reduction of the environmental impact of the energy sector combined with the optimal use of own energy resources.** The document sets out the framework for the energy transformation in Poland and includes strategic considerations for the selection of technologies conducive to building a low-carbon energy system.

Three pillars were identified in order to define the main objective: **Just transition** (including the transformation of coal regions; reduction of energy poverty; new industries related to RES and nuclear energy), **Zero-carbon energy system** (including offshore wind energy; nuclear energy; local and civic energy), and **Good air quality** (including the transformation of heating engineering; electrification of transport; and the "Home with Climate" program). These three pillars underpin the aforementioned **eight specific goals.**[15]

[12] Park&Ride (P&R) - a system of parking lots located primarily in the vicinity of rail transportation routes, intended for people transferring from cars to public transport. Drivers leave their cars in designated places, change to public transport and continue their journey to the city center.

[13] 1. Building an integrated, interconnected transport network for a competitive economy; 2. Improving the organisation and management of the transport system; 3. Changes in individual and collective mobility; 4. Improving the safety of road users and transported goods; 5. Reducing the negative impact of transport on the environment; 6. Improving the efficient allocation of public funds for transport projects.

[14] This applies, among others, to medium-sized cities losing their socio-economic functions and areas at risk of permanent marginalisation.

[15] 1. Optimal use of own energy resources; 2. Development of generation and grid infrastructure; 3. Diversification of supplies and development of grid infrastructure for natural gas, crude oil and liquid fuels; 4. Development of energy markets; 5. Implementation of nuclear energy; 6. Development of renewable energy sources; 7. Development of heat generation and co-generation; 8. Improvement of energy efficiency.

The document states that **in 2030 the share of coal** in electricity generation will **not exceed 56%;** the share of **RES** in final energy consumption will be **at least 23%; greenhouse gas (GHG) emissions** will be **reduced by 30%** compared to 1990; **primary energy consumption** will be **reduced by 23%** compared to 2007 projections. A timetable for commissioning 6 nuclear units from 2033 to 2043 has also been drafted, with **Bełchatów listed as one of the possible locations.**

II. DEVELOPMENT TRENDS

Poland's economic and social development has resulted in increasingly strong ties between Polish regions and the European and global economies. Together with the free flow of people and capital, this deepens the vulnerability of Polish regions to global trends affecting its economy, society and space.

One of the most important trends is **globalisation,** which has an economic, social, political, and cultural dimensions. The intensified flow of goods, capital and labour on a global scale, along with the development of transport, communication, telecommunications and a rapid flow of information accompanied by transformations in the social, cultural, political and systemic spheres, have led to confrontation and rapprochement in this respect between states, nations, and the global population. Globalisation processes lead to increasing interdependence and integration of countries and regions, resulting in the creation of "one world" - the world society of the "global village." The above poses a development opportunity for the Lodzkie Region, both in terms of attracting new investors, and procuring new outlets for products and services, which must be sufficiently modern and competitive.

The process of globalisation is facilitated by that of **digitalisation**, i.e. the rapidly growing use of data and software in services, production, distribution and sales processes. Digitalisation and the **development of the information society** influence social behavior patterns, change habits, and provide new opportunities, and together with the development of the Internet, have become the basis for the fourth industrial revolution. This trend likewise constitutes an opportunity for the Lodzkie Region, enabling e.g. the development of e-services. The ever-increasing demand for transmission of large amounts of data makes it necessary to introduce new standards of wireless telecommunications that enable machine-to-machine (M2M) communication. The answer to this challenge lies in the fifth generation mobile technology (5G),[16] whose implementation means an increase in data transfer speed, network capacity, and connection stability. This is particularly important for the widespread opening and diffusion of modern technologies in everyday life, such as the Internet of Things, as well as smart city, smart home, virtual reality, augmented reality or connected cars.

Industry 4.0, also known as the fourth industrial revolution, is a trend involving the use of advances in computerisation, automation, and information and communication technology (ICT) in manufacturing. It entails a comprehensive digital transformation of all assets and deeper integration with value chain partners within digital ecosystems. Today, companies are connecting and integrating processes and equipment in an advanced way, deepening automation as a result of the third industrial revolution, and leveraging the cloud technology and 3D printing. The burden of planning production and supervising processes is being shifted from people to computers through the use of advanced algorithms and the Internet of Things.

Global trends are also related to the transport sector. Modern solutions in this respect, such as the implementation of **alternative power sources** in vehicles, are an attempt to address contemporary social and environmental problems related to the quality of life of societies, such as noise, congestion, and smog. These changes concern both individual vehicles and public transport in general, while also affecting freight in the long-term perspective. One important challenge for countries will involve the construction of universally accessible charging infrastructure. Concepts related to shared transport modes are becoming more and more common, especially in agglomerations. Systems such as car-sharing,[17] e-scooters, e-trucks are being developed, allowing to reduce the number of combustion engine vehicles. Both directions influence the minimisation of the adverse effects of transport on the environment, which is particularly important for the Lodzkie Region in the context of challenges related to road congestion and air pollution.

However, not all global trends may provide opportunities for the development of the Lodzkie Region. **Demographic changes** related to the ageing of societies are a significant problem faced not only by the Lodzkie Region. Among the 25 oldest societies in the world, 22 are located in Europe (including Poland and other countries

[16] 5G - the latest fifth generation of mobile technology replacing 4G/LTE. It is characterized by high stability, reliability, and transfer speeds of up to 20 Gbps (download) and 10 Gbps (upload), with a load capacity of up to 1 million devices per square kilometer.

[17] Car-sharing - a system of sharing passenger cars. Cars are rendered available for a fee to users by vehicle fleet operators, which include various companies, public agencies, cooperatives, associations or groups of individuals. The use of the car-sharing system increases the intensity of vehicle use per day, which translates into a decrease in the growth of privately registered cars.

of Central and Eastern Europe). The ageing of societies affects almost all spheres of social and economic life, and poses both threats (especially to the labour market) and opportunities for the development of new products and services, e.g. the silver economy.

Progressing **climate change** result in the occurrence of extreme weather phenomena (wind storms, downpours, droughts, higher air temperatures)[18]. The areas of the greatest accumulation of problems associated with extreme phenomena are the cities whose population exceeds 100,000 residents; they are particularly threatened by heat waves, intense rainfall,[19] storms and urban flooding.[20] Modern-day droughts, referred to as the "droughts of the century," will recur more often than every 10 years. Currently, 38.0% of Poland's arable and forest areas[21] are at an extreme and high risk of agricultural drought.[22] The "floods of the century" will occur every few years in Northern and North-Eastern Europe, in Central and Eastern Europe (including Poland) and in the Atlantic part of Southern Europe.[23] In the face of the diagnosed problems related to climate change, particularly acute losses will be felt in agriculture, forestry and tourism, in the size of the available surface water resources, which in the long-term perspective will result in the intensification of the level of risk of drought (mainly agricultural and hydrological), along with the reduction of biodiversity and an increase in the number of wildfires.

Climate change, resulting among others from the rising carbon dioxide emissions, confronts all European regions whose economy is largely dependent on coal and lignite mining and power generation with a difficult challenge of **economic transition towards climate neutrality**. Apart from the obvious positive impact on the natural environment, the consequences of this process will include: permanent change of the industrial structure, significant transformations in the regional labour market and the need to look for new, ecological energy sources. Potential adverse changes may also relate to the reduction of income of the population and local governments, outflow of populations from the "coal regions," and increasing structural unemployment. The role of central, regional and local administration is to moderate changes in the direction of just transformation, which means minimizing social and economic risks resulting from the loss of an important element of the economic ecosystem.

Adverse social and economic effects may also be caused by the **dwindling natural resources**. In this context, the **Circular Economy (CE),** whose basic assumption is the use of waste generated in a production process for the purpose of other processes, gains particular significance. The concept of CE assumes a rational use of available resources by means of using non-renewable raw materials to the lowest possible extent, reducing the amount of landfills and minimizing the negative environmental impact of this process, as well as extending the life cycle of products. Thanks to this concept, the model of consumption is changing to a more conscious and responsible one. The implementation of the assumptions of circular economy may provide an opportunity for the enterprises of the Lodzkie Region; however, in order for them to tap into this potential, it is necessary to carry out technological modernisation.

A new global challenge that emerged in the first quarter of 2020 is the SARS-CoV-2 virus pandemic and its far-reaching social and economic impact, a major health and humanitarian crisis, and - in the long run - an economic and financial crisis. The problems associated with the disruption of supply chains as a result of the pandemic are a harbinger of corporations undertaking to establish supplier networks closer to their headquarters and consumers, and countries seeking to produce essential items locally. Stopping a pandemic will not be possible without a global effort and cooperation. The crisis caused by the COVID-19 pandemic will require decisive actions in almost all areas of economic and social life. Actions related to enhancing resilience and adaptive capacity, mitigating the social and economic impacts of the crisis, and supporting the environmental and digital transformation will be crucial in this respect. The COVID-19 pandemic has helped accelerate digital transformation in many areas of economic and social life, as well as the spread of remote working and learning. In the current

[18] In the Paris Agreement (signed in December 2015), 195 countries committed to keep the rise in global average temperatures well below 2 degrees C above the pre-industrial levels and undertake continuous efforts to limit the rise in temperatures to 1.5 degrees C - https://naukaoklimacie.pl/aktualnosci/ocieplenie-o-1-5-stopnia-specjalny-raport-ipcc-308

[19] The number of days with extreme precipitation above 10 mm/day in cities is increasing as per the Ecological Policy of Poland 2030 Ministry of the Environment, Warsaw, 2019.

[20] "Climate change adaptation plans of 44 Polish cities: A summary publication," Warsaw 2018 (www.44mpa.pl).

[21] According to the reports of the Agricultural Drought Monitoring System in Poland http://www.susza.iung.pulawy.pl/tabele/10/ for the period from 1 June 2019 to 31 July 2019, in 115 (out of 177) communes in the Lodzkie Region, the total share of soils susceptible and very susceptible to the threat of agricultural drought in agricultural land fell in the range of over 75%.

[22] Danger class IV and III. Draft plan for the prevention of drought results, State Water Holding Wody Polskie.

[23] Flood risk management plans for the Oder and Vistula river basins.

crisis, the EU and its Member States are working together to limit the expansion of the virus, strengthen health systems, mitigate the socio-economic impact of the pandemic, and support workers and companies. This challenge will be faced both nationally and by individual regions, including the Lodzkie Region, and its results will be experienced in the long-term perspective.

III. DIAGNOSIS OF THE SOCIO-ECONOMIC SITUATION AND MAIN DEVELOPMENT CHALLENGES FOR THE LODZKIE REGION

The Lodzkie *(Łódzkie)* Region is located in central Poland and covers an area of 18,219 km2 (9th place among regions). According to Statistics Poland, as of June 2020 the Lodzkie Region was inhabited by 2 448 713 people (which made it the 6th most populated region in Poland). The population density was higher than the Polish average of 123 inhabitants per km2, and sat at 135 inhabitants per km2, with the urban population reaching 1,320 inhabitants per km2 and rural areas 54 inhabitants per km2. The urbanisation rate was 62.4%, which gave the Lodzkie Region the 7th position in Poland.

The administrative structure of the Lodzkie Region consists of 21 districts (*powiat*) and 3 cities with district (*powiat*) rights (Łódź, Piotrków Trybunalski, Skierniewice). The basic settlement network consists of 177 communes (*gmina*), including 18 urban, 28 urban-rural, and 131 rural ones. On 1 January 2020, Piątek and Lututów joined the group of urban-rural communes (due to a lack of statistical data, they are not included in further analyses).

Fig. 3. Administrative division of the Lodzkie Region in 2021

Source: own compilation of the Spatial Planning Office of the Lodzkie Region

As a result of analytical work and expert knowledge, the most important potentials and development problems of the region that require actions to be taken until 2030 were identified. The analyses were based primarily on data obtained from public statistics, with data from other sources indicated in every respective instance.

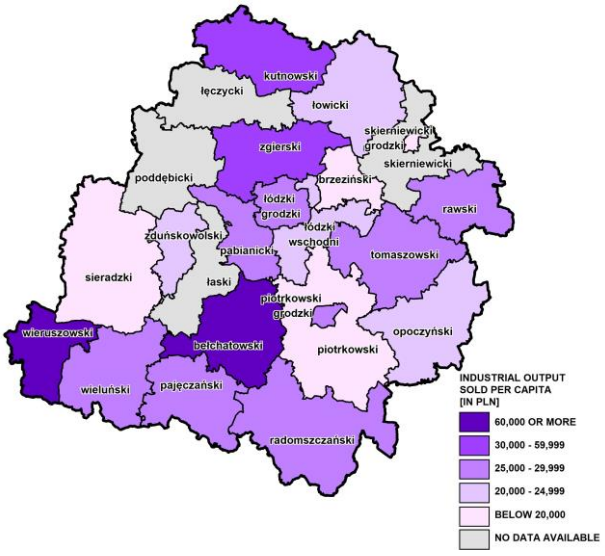
Industry

Challenge: Transforming the industrial sector

The Lodzkie Region is one of the relatively well-developed Polish regions, with a high share of industry in gross value added (28.9% in 2018, against the Polish average of 25.8%) and a dynamically growing share of services, but when measured against the European Union scale the Lodzkie Region is nonetheless a less developed region, failing to reach the threshold of 75% of the EU development level. **In 2019, in terms of industrial output sold per capita,** the Lodzkie Region was ranked 7th in the country (PLN 32,324 vs. the Polish average of PLN 38,542),[24] and the growth rate of this indicator in 2010-2019 was 162.5% vs. the Polish average of 161.3%. In the intra-regional context, the most developed industrial sector (>3 billion PLN of total industry output sold annually) is concentrated in the following districts: Bełchatowski, Łódź, Kutnowski, Zgierski, and Pabianicki. Per capita, the highest values of this indicator in 2019 were recorded in the following districts: Bełchatowski, Wieruszowski, Kutnowski, and Zgierski. Relatively low values of industry output sold per capita are recorded in districts dominated by agriculture (e.g. Piotrkowski) or services (e.g. eastern part of the Łódź East district).

The dynamics of industrial output sold in the period from 2010 to 2018 indicates that the light industries traditionally associated with the Lodzkie Region have a negative (manufacture of leather and leather products), low (manufacture of clothing) or at most average (manufacture of textiles) growth rate. The fastest growth in the above period was observed in the industrial output sold for paper, metals, motor vehicles, trailers and semi-trailers, chemicals and chemical products, printing, and the reproduction of recorded media.

Fig. 4. Industrial output sold per capita in 2019.
Source: Own compilation based on Statistics Poland data



In 2019, the share of products of entities classified as high and medium-high technology in the Lodzkie Region amounted to 27.6% (11th place) against the Polish average of 34.2%. According to the synthetic innovation indicator RIS,[25] in 2019 the Lodzkie Region was ranked 7th in the country, and the size of the said indicator has been steadily improving. **The intensifying cooperation of industrial enterprises with the R&D sector, and the use of regional specialisations and strong industrial traditions**[26] (e.g. in the production of food products, pharmaceuticals, textiles and clothing, furniture production) will contribute to further growth of competitiveness and innovation in the sector.

The level of **internal expenditure on R&D per capita** in the Lodzkie Region in 2018 amounted PLN 485.2 (5th place) compared to the Polish average of PLN 659.9, but **in relation to the GDP** it translates into 0.94% (7th place), i.e. less than the national average (1.21%). An important requirement for effective modernisation of the economic structure of the region towards a knowledge-based economy is a greater increase in R&D expenditures; the EU average of R&D expenditures in relation to GDP in 2018 was calculated at 2.18%.

[24] Statistics Poland data for 2019. Applies to entities with a total of employees at > 9.
[25] Regional Innovation Scoreboard, 2019 edition.
[26] This conclusion is based on the analysis of the volume of industrial production sold in the industrial processing sectors on the basis of the Statistical Yearbook of the Lodzkie Region for 2019.

A huge challenge in terms of regional industrial transformation is the transition of the **energy sector.** The Lodzkie Region is one of the largest electricity producers in Poland, thanks to the Bełchatów Power Plant and the affiliated lignite mine. The climate policy of the European Union seeks to retire coal-fired power units, whereas the Bełchatów mining complex is responsible for production of about 20% of electric energy used in the country. It is also one of the largest employers in the Lodzkie Region, which means that the transition process will be complex, costly and time-consuming.

At the same time, the process of industrial transformation in the region must involve the widest possible implementation of the principles of **circular economy**. Above all, this entails the need to develop the market for secondary raw materials and support the conversion of waste into raw materials. The challenges facing the industrial sector also include minimizing the production of non-recyclable waste and rationalizing the use of non-renewable raw materials, as well as encouraging the use of methods that rationalize the product's life cycle.

Fig. 5. Synthetic indicator of regional innovation ("Regional Innovation Scoreboard") in 2019.

Source: European Commission

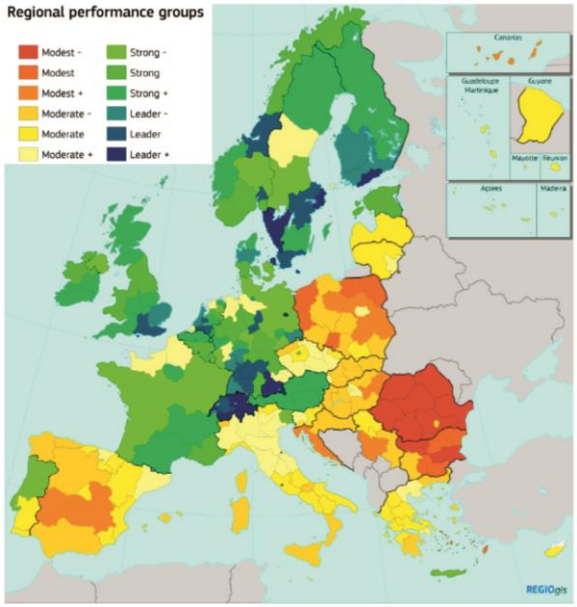
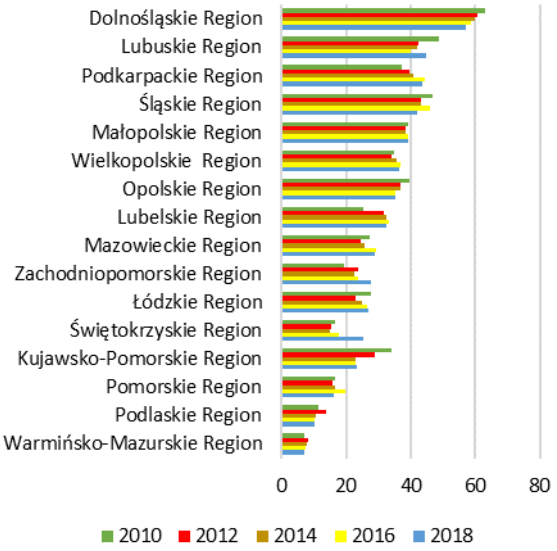


Fig. 6. Share of net income from sales of products of entities classified as high and medium-high technology between 2010 and 2018.

Source: Own elaboration based on Statistics Poland data



Agriculture

Challenge: Maintaining the advantage in agricultural specialisation and agri-food processing

Thanks to its endogenous potential in terms of agricultural production and foodstuffs, among other things, the Lodzkie Region is considered a region with high potential for the development of a bioeconomy,[27] which in the long-term perspective will provide an answer to many global challenges related to food security, energy security, growing restrictions on water, arable land and carbon dioxide emissions.

Agricultural activity is strongly dependent on natural factors: relief, soil quality and climate. The Lodzkie Region has average natural conditions for agricultural production. The value of the synthetic indicator of valorisation of agricultural production space[28] (61.9 points) is lower than the Polish average (66.6 points) and in

[27] Bioeconomy covers all sectors and systems that make use of biological resources. It is one of the largest and most important sectors in the EU economy and includes agriculture, forestry, fisheries, food, bioenergy and bioproducts. Bioeconomy is one of the pillars of circular economy, and the management of renewable resources, i.e. the so-called biomass in the entire life cycle is based on the processing, production and sale of goods, as well as bio-waste management. Apart from forestry and fisheries, agricultural production is one of the main sources of biomass.

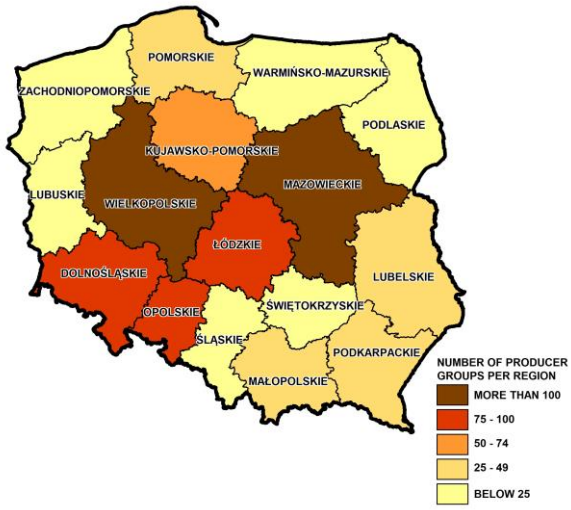
[28] Valorisation index of agricultural production space is a synthetic index assessing natural conditions for the development of agriculture. It assigns point values to four features: quality and agricultural use of soils (max. 100 points), agricultural climate (max. 15 points), water conditions (max. 5 points) and lay of the land (max. 5 points).

this respect the region ranks 14th in the country. **The largest compact area of communes with the best conditions for agricultural production is located in the northern and north-western parts of the region**. The belt of communes located in the center of the region and a smaller area of a few communes located in the Wieluński and Wieruszowski districts are also characterized by favorable natural and soil conditions.

One of the most **important threats to agricultural development is water scarcity.**[29] The ongoing climate change in the 21st century has manifested itself in the increasing instability of weather conditions and continues to pose serious challenges for agricultural production.[30] The increase in average annual temperature, the decrease in the number of days with snow cover, and the lengthening rainless periods in the vegetation season of crops will contribute to the increase in frequency and intensity of droughts.[31] Over the past several years, drought problems in agriculture have been faced by agricultural producers throughout the region.[32]

Despite rather unfavorable natural conditions, the Lodzkie Region has achieved good results in terms of agricultural production. In 2018, agricultural commodity production per 1 ha of agricultural land was 8.2% higher than the national average and amounted to PLN 6,594 (against the national average of PLN 6,093). Achieving high production results is supported by the introduction of modern plant and animal production technologies.

Fig. 7. Number of agricultural producer groups (as of May 2020)
Source: Own study based on Agency for Restructuring and Modernisation of Agriculture data



The **development potential of agriculture** is created by sectors that stand out in the country: vegetable growing and fruit farming, potato production, pig and cattle breeding, and milk and hen eggs production. The region occupies a significant position in the country with respect to the harvest of ground vegetables (ranking 3rd countrywide), production of fruit from trees (ranking 4th countrywide) and fruit from fruit bushes and berry plantations (ranking 3rd countrywide), harvest of potatoes (ranking 2nd countrywide), stock of pigs per 100 ha of agricultural land (ranking 2nd countrywide), stock of cattle per 100 ha of agricultural land (ranking 6th countrywide), purchase of milk (ranking 5th countrywide) and production of hen eggs (ranking 3rd countrywide). A diversified base of raw materials coming from both plant and animal production is a cornerstone for the development of the processing industry: dairy, fruit and vegetables, meat and grain. Vegetables, fruit and vegetable products have a significant share in the group of export goods of the region. Apart from conventional agriculture, **organic farming** has been developing more and more dynamically, responding to the current EU trends and consumer demand for high quality food.

The international competitive advantage of the Lodzkie Region in terms of agriculture is confirmed by its membership in a narrow group of 54 regions in the European Union specializing in pig breeding. In terms of milk production performance, the region ranks among the 44 most efficient EU regions.[33]

[29] Based on the reports of the Agricultural Drought Monitoring System in Poland http://www.susza.iung.pulawy.pl/komentarz, http://www.susza.iung.pulawy.pl/KBW, agricultural drought was recorded in the Lodzkie Region from 1 April 2019 through 31 August 2019. The largest water deficit was registered in the period from 1 June 2019 to 31 July 2019, when the Climate Water Balance (KBW) values in the region reached the least favorable values (from -259 mm to -240 mm) in the Łódź Hills, while in the rest of the region they exceeded the value of -210 mm.

[30] Strategy of Sustainable Rural, Agricultural and Fisheries Development 2030.

[31] Agriculture in the face of drought and food security, M. Zieliński, Ph.D., J. Sobierajska, M.Sc., Institute of Agricultural and Food Economics - National Research Institute. Food Industry Economics Department, IERIGŻ-PIB.

[32] Agricultural Drought Monitoring System developed and implemented by the Institute of Soil Science and Plant Cultivation – State Research Institute.

[33] Eurostat regional yearbook, 2018 edition.

The fundamental entity in agricultural production is the family-owned farm. As of 2020, the **average area of arable land per farm** amounted to 7.98 ha[34] (13th in the country, against the national average of 11.04 ha), which was 0.5 ha more per farm than in 2010.

The cooperation of agricultural producers is an important factor in dynamising agricultural development. Horizontal integration in the agricultural sector is a way to counter the progressive concentration of trade and processing structures, and an alternative to the costly process of land concentration. In terms of the number of **producer groups** in the regions, the Lodzkie Region is one of the leaders in Poland. Despite the fact that the region is home to 80 groups[35] of agricultural producers and 17 recognized fruit and vegetable producer organisations, the degree of integration is still too low, which is a nationwide problem. Only 5% of commodity agricultural production is sold through producer groups.

The marketing of quality products and food produced by local farmers in new forms, with the participation of so-called grassroots local initiatives within the framework of **short supply chains**, is becoming an increasingly widespread phenomenon. Thanks to these solutions, farmers are able to offer consumers fresh products at attractive prices.

Modern services sector

Challenge: Using the potential of the Lodzkie Region to develop the services sector, including innovative services and logistics

In terms of the share of **employees working in the services sector**, the Lodzkie Region ranks 9th in Poland[36] (Lodzkie Region 55.1%; Poland 58.0%), while in terms of the growth rate of employees working in this sector in 2010-2019, the region recorded a 3.11 percentage point increase, and ranks second in Poland in this respect. The above values demonstrate significant changes in the employment structure.

Fig. 8. Share of employees by section groups in Poland in 2019 [expressed in %]
Source: Own compilation based on Statistics Poland data

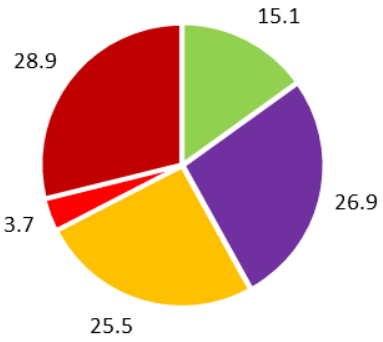
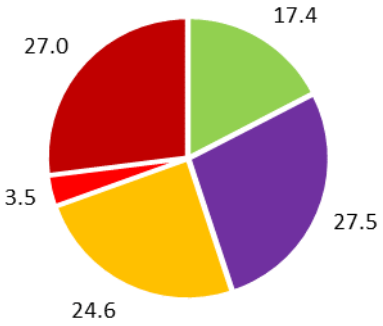


Fig. 9. The share of employees by section groups in the Lodzkie Region in 2019 [expressed in %]
Source: Own compilation based on Statistics Poland data



- agriculture, forestry and fishing
- industry and construction
- trade; repair of motor vehicles; transportation and storage; accommodation and catering; information and communication
- financial and insurance activities; real estate activities
- other services

The highest share of employees working in the services sector can observed in Łódź (75.1%) and two other cities with district rights: Piotrków Trybunalski (63.0%) and Skierniewice (59.2%). The lowest share was recorded in the districts: Skierniewicki (19.3%) and Poddębicki (23.1%). Between 2010 and 2019, the districts: Skierniewicki, Piotrkowski, and Pabianicki also recorded the highest increase in the share of employees in services .

[34] Agency for Restructuring and Modernisation of Agriculture (ARMA), Appendix to the announcement by the ARMA President dated 16 September 2020.
[35] Data based on ARMA register (as of May 2020).
[36] Data on employment by section group, including private farming.

A specific group is the **modern business services (BPO) sector,**[37] which has been developing dynamically in large Polish cities. In the Lodzkie Region, BPO services are primarily concentrated in the capital of the region, and to a much smaller extent in the neighboring districts. For the past decade, Łódź has been gradually increasing its attractiveness for companies providing professional, IT and telecommunications, financial, insurance and manufacturing services.[38] It is worth noting, however, that although Łódź has the highest share of people employed in services in the region, in comparison with other regional capitals this ratio is still low (with Łódź ranking 12th among the 18 regional cities).[39]

In 2019, the percentage of **innovative services enterprises** in the Lodzkie Region amounted to 10.4% (8th among all regions), which was close to the national average of 11.9%. Service companies in the Lodzkie Region are also characterized by an average level of outlays on innovative activities. The share of total outlays in the years 2010-2019 in the total national outlays amounted to 2.02%[40] (7th among all regions).

The region is also one of the largest areas in the country in terms of the concentration of logistic activities. It is a specific type of services that is complementary to other economic activities. The attractiveness of the Lodzkie Region for logistics services is, among others, owed to its convenient transport location, the presence of production and service base and the proximity of large sales markets. Logistic parks are located mainly in Łódź and its vicinity (in the area of Stryków) and in the area of Piotrków Trybunalski. As of the end of 2019, the supply of multi-tenant[41] and build-to-suit (BTS)[42] warehouse space in the region sat at 3.12 million sqm, accounting for 16% of the total warehouse space in the country (3rd in the country).[43]

Entrepreneurship

Challenge: Low level of entrepreneurship among residents

In terms of the **level of entrepreneurship**, expressed by the number of entities in the REGON system per 10,000 population, in 2019 the Lodzkie Region ranked 10th among all 16 regions (1,036 entities per 10,000 population, against the national average of 1,175 entities per 10,000 population). Additionally, in terms of the growth of new entities measured by the ratio of newly registered entities per 10,000 population, the region ranked at the rather average 8th position. The Lodzkie Region is also characterized by a lower **number of entities with foreign capital** than the Polish average. Apart from a few urban-rural communes, the highest entrepreneurial activity is characteristic for cities and the communes of Łódź metropolitan area, whereas the lowest level of saturation with business entities occurs in peripherally located rural communes.

The increase in the competitiveness of enterprises is stimulated by the **activity of academic and research institutions**. In the Lodzkie Region, research and development is carried out by 15 scientific institutions, including the institutes of the Polish Academy of Sciences and affiliates of the Łukasiewicz Research Network, as well as higher education institutions.[44] These institutions form consortia and centers established to carry out specific research projects. Additional technical and scientific support for specific industries and specialisations is provided by **Research and Development Centers (RDCs).** These are scientific entities or entrepreneurs who are not research

[37] BPO – Business Process Outsourcing – the process of outsourcing business services to specialized external partners.
[38] Applies to headquarters or regional centers of manufacturing companies.
[39] According to data for 2019, 75.1% of the total workforce in Łódź worked in the services sector, compared to the average of 80.2% for all 18 capital cities of the country's regions.
[40] The value indicates the total outlays on innovative activities in service companies in the Lodzkie Region in 2010-2019 in relation to the total outlays of such companies in Poland.
[41] Warehouse parks rendered available by the developer and intended for lease on the open market.
[42] Warehouse facilities erected for dedicated recipients, enabling tenants to freely compose the respective modules of storage space.
[43] Cushman&Wakefield, Warehouse market in Poland: a summary for 2019.
[44] ŁUKASIEWICZ Research Network - Institute of Leather Industry, ŁUKASIEWICZ Research Network - Institute of Textiles, ŁUKASIEWICZ Research Network - Institute of Biopolymers and Chemical Fibres (COBRO branch – Packaging Research Institute), European Regional Center for Ecohydrology of the Polish Academy of Sciences, Institute of Security Technologies MORATEX, Centre of Molecular and Macromolecular Studies of the Polish Academy of Sciences, Institute of Medical Biology of the Polish Academy of Sciences, Polish Mother's Memorial Hospital - Research Institute, Jerzy Nofer Institute of Occupational Medicine, Institute of Horticulture, Institute of Agricultural and Food Biotechnology (Department of Food Quality, Department of Refrigeration Technology and Applications), Energy Institute, ITC Heating Technology Department in Łódź, Pro-Akademia Research and Innovation Centre, Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Center of Research on Old Technologies in Łódź, Łódź Museum of Art, Lodz University of Technology, University of Lodz

institutes per se but conduct research or development projects. In 2020, 41 entities had the RDC status in Poland, 4 of which were based in the Lodzkie Region.[45] However, the problem lies in the insufficient level of cooperation between the R&D sector and commercial enterprises - in the Lodzkie Region less than 4.5% of enterprises were involved in cooperation in the field of innovative activities,[46] compared with the national average of 5.1%.

Fig. 10. Number of national economy entities in the REGON register per 10,000 population in 2019.

Source: own elaboration based on Statistics Poland data

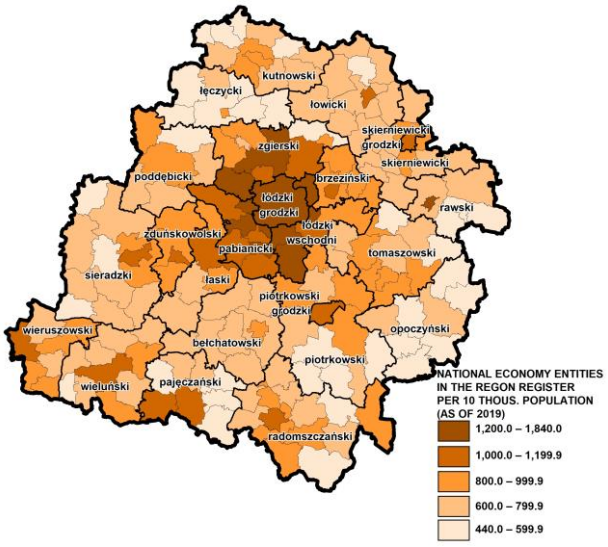
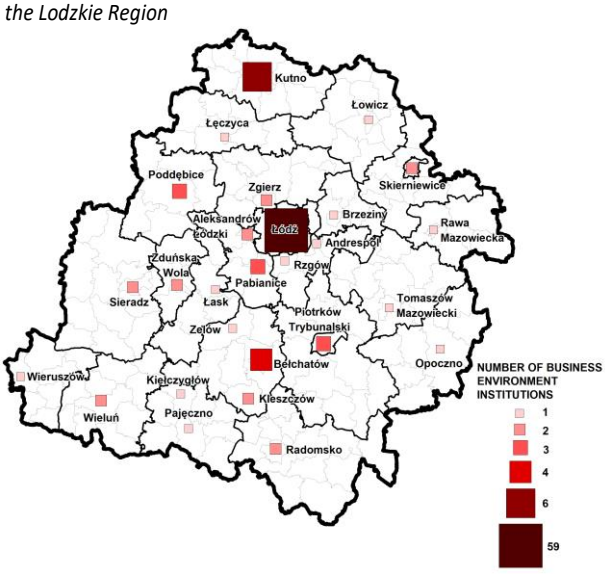


Fig. 11. Spatial distribution of business environment institutions in the Lodzkie Region in 2019

Source: own study based on data from the Spatial Planning Office of the Lodzkie Region



The growth of entrepreneurship is limited by the uneven distribution of **Business Environment Institutions** (BEIs) and their under-diversified profile of activity. A commonly encountered problem in this type of institutions is their relatively unattractive offer for entrepreneurs. More attractive forms of support[47] are available in academic enterprise incubators, technology parks and capital institutions. However, such BEIs[48] are mostly located in Łódź and on the premises of several industrial parks and industrial-technological parks located outside of Łódź.

An important tool to support entrepreneurship is the activity of **Lodz Special Economic Zone,**[49] which is part of the Polish Investment Zone,[50] with the latter allowing entrepreneurs to invest on any real estate and apply for income tax exemptions. The Zone attracts investments of modern industry, supports projects carried out by companies from the SME sector, co-finances trainings and workshops, while also supporting startups in creating innovation. The Zone has been the first in the world to introduce the 5G technology to the factories of its associate investors.

Vocational and lifelong learning

Challenge: Low interest in vocational and lifelong learning

Economic development is inextricably linked to the quality of **human capital**, which is particularly important for the present and future labour market.

[45] ASM - Center for Market Research and Analysis sp. z o.o., SANGO TECHNOLOGIES sp. z o.o., TRICOMED S.A., BIOFANA sp. z o.o. Pharmaceutical and Clinical Research Centre.
[46] Applies to industrial companies.
[47] Forms of support offered by these institutions include e.g. facilitating access to modern technologies and technology platforms, access to production areas, incubation and acceleration of enterprises (including start-ups and entities representing the high technology and IT industry), and above all access to attractive sources of financing innovative business activity (e.g. seed capital and venture capital).
[48] In particular with reference to the Łódź Special Economic Zone, Bionanopark, and academic technology transfer centers.
[49] In the latest fDi Magazine's Free Zones of the Year ranking, the Łódź Special Economic Zone was ranked 2nd among the best economic zones in Europe; it was also awarded the title of the best zone for companies operating in the SME sector.
[50] The Mniszków commune in the Lodzkie Region is home to a sub-zone of the Starachowice Special Economic Zone.

In terms of the **education structure**, the Lodzkie Region was close to the national average. Although as much as 63.5% of the region's population have at least secondary and higher education, their skillsets did not always meet the employers' demands.

The annual reports of the Regional Labour Office indicate that employers in the Lodzkie Region tend to look for employees with simple professional qualifications.[51] Meanwhile, the **interest in vocational education has been steadily declining for many years**. In the years 2010-2019, the number of students at basic vocational schools, vocational schools of the first degree and specialized vocational schools decreased by 21% (5th position in the country in terms of the decrease rate). Shortages in adequate numbers of employees with the qualifications desired on the labour market on the one hand reduce the competitiveness of the economy, causing recruitment problems for employers, and on the other hand, cause workers with higher qualifications to take up work at lower positions.

From the 2019/2020 school year onwards, **schools have been obliged to cooperate with employers** before launching a new profession,[52] which can positively affect the introduction of majors in accordance with the market demand, as well as the preparation and implementation of internships and apprenticeships and the dissemination of dual education.[53] The main problem involves providing schools with the teaching staff who would educate students in accordance with the market demand, especially in the field of practical vocational training; another problem is the lack of modern and functional infrastructure in schools.

Fig. 12. Structure of education in the Lodzkie Region in 2019 (expressed in %)
Source: Own study based on Statistics Poland data

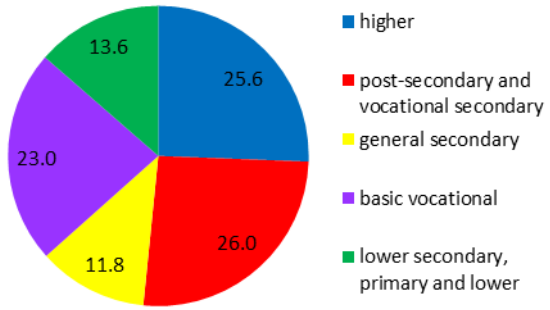
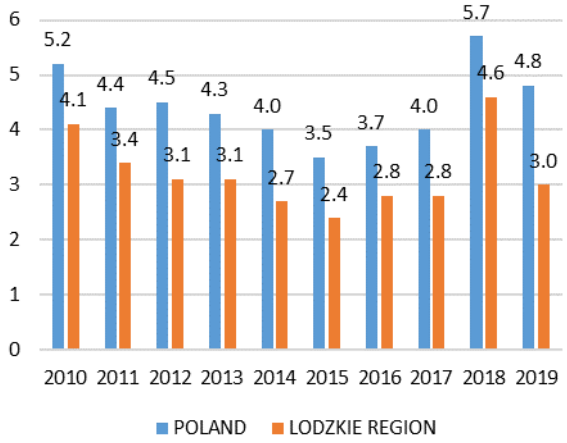


Fig. 13. Adults aged 25-64 participating in education or training in 2010-2019 [expressed in %]
Source: Own study based on Statistics Poland data



An additional challenge in the context of the developing Economy 4.0 is the need to increase the percentage of individuals with basic and secondary **key competences**,[54] **including digital ones.** The ongoing changes in the labour market render the competencies that distinguish human work from the work of IT systems, robots or artificial intelligence particularly important. Digital education supports the overall education process. As of the present, among others due to the threat of COVID-19, distance learning is one of the most dynamically developing areas tied to the education sector.

Another problem is the low participation of the region's residents in **lifelong learning**, which helps expand their competencies in the labour market. It results from such factors as the low social awareness of the benefits entailed in raising qualifications and participating in lifelong learning, as well as an insufficient educational offer

[51] *Occupations Barometer 2020* – a summary report on the survey conducted in the Lodzkie Region, Regional Labour Office in Łódź.
[52] Education Law (Journal of Laws of 2020, item 910) article 68 sections 1 & 2.
[53] Dual vocational education denotes theoretical vocational education at school combined with practical vocational education at the employer's (as defined by the Ministry of National Education in the document "Dual education in the Polish model of vocational education").
[54] Key competences are divided into basic and transversal. There are 4 basic key competences (understanding and producing information; multilingualism; mathematical competences; natural sciences, technology and engineering competences) and 10 transversal (entrepreneurial; personal, social and learning; digital; cultural awareness and expression; multicultural; teamwork; ability to adapt to new conditions; leadership; critical thinking and complex problem solving; citizenship). (Source: Council Recommendation on key competences for lifelong learning, European Commission, Brussels, 17 January 2018).

in relation to the needs of the labour market. In 2019, 3.0% of people aged 25-64 participated in education or training(s) in the Lodzkie Region, as the value of this indicator was significantly lower than the national average (4.8%).

We are also increasingly dealing with new learning environments, such as **distance learning and hybrid learning**,[55] which rely on information and communication technologies to support one's self-education and shield one from social exclusion. One of these learning environments is e-learning.

Higher education

Challenge: Untapped potential of higher education institutions in the Lodzkie Region

Higher education is another significant factor that impacts the quality of human capital. **The Lodzkie Region is a significant academic center in the country**; according to Statistics Poland, as of the academic year 2018/19, the region was home to **23 higher education institutions**, including 7 public universities. Higher education institutions are an important driver in pulling young people to urban areas. The analysis of the scope of impact of higher education institutions in the Lodzkie Region[56] showed that students from outside the Lodzkie Region are especially attracted to the Polish National, Film, Television and Theatre School. In the case of both the University of Lodz and the Lodz University of Technology, the ratio of students who come from the Lodzkie Region exceeds 80%.

Fig. 14. Communes of residence for students of public higher education institutions in the Lodzkie Region in the academic year 2018/2019

Source: own compilation based on the Spatial Planning Office of the Lodzkie Region data

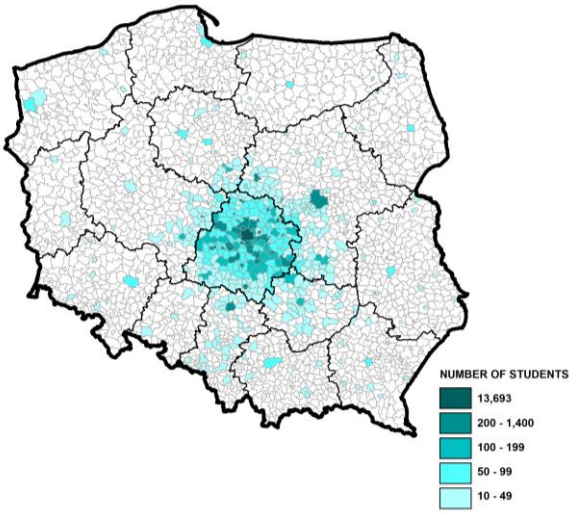
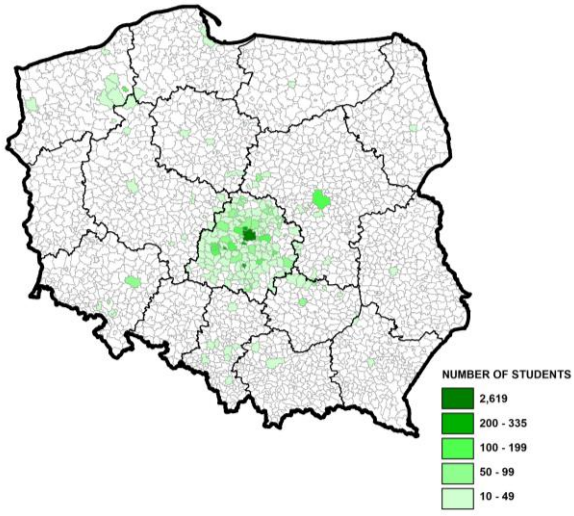


Fig. 15. Communes of residence for students of private higher education institutions in the Lodzkie Region in the academic year 2018/2019

Source: own compilation based on data obtained from the Spatial Planning Office of the Lodzkie Region



In the 2020 ranking of higher education institutions in Poland, the positions of public universities placed in Łódź ranged from 8th (Lodz University of Technology) to 15th (University of Lodz) out of approximately 90 higher education institutions in the country, while the scores awarded to private institutions ranged from 10th (University of Social Sciences) to 26th (University of Humanities and Economics) out of approximately 50 higher education institutions.[57] It is worth noting, however, that apart from general university ratings, the above ranking was also

[55] In the hybrid model, the learning process related to the acquisition of theoretical knowledge is supplemented by practical classes conducted by specialists in real-life conditions, which in effect prepares the student for work in a better way. One unquestionable benefit arising from the use of the hybrid education model is the learning of attitudes and competencies valued by employers: entrepreneurship, respect for work, loyalty to the workplace, responsibility for entrusted tasks, eagerness to continuous education and improvement of one's qualifications, which is essential in the context of changes spurred by the technological transformation entailed in economy 4.0.

[56] "The scope of impact of higher education institutions in the Lodzkie Region" - a study conducted by Spatial Planning Office of the Lodzkie Region in 2019, in which 18 higher education institutions operating in the Lodzkie Region were examined, including 7 public and 11 non-public ones (seminaries were excluded from the study).

[57] Ranking of Higher Education Institutions "Perspectives 2020."

conducted for individual fields of study, in which some programs offered by Łódź universities rank among the very top in the country.

The untapped potential of Łódź universities may be evidenced by the fact that both the Lodz University of Technology and the University of Lodz were not among the research universities selected for the competition of the Ministry of Science and Higher Education under the first edition of the "Initiative of Excellence - Research University" program (IDUB) in 2019. Nevertheless, it is worth noting that the very qualification to participate in the competition is a significant success, as only 20 universities were eligible to participate, each of which met the restrictive conditions regarding the quality of education as well as diversified profile of activities.

The position of Łódź universities in the rankings is also influenced by the aspect of the city's reputation and its attractiveness as perceived by the public opinion. Compared to Warsaw, Kraków, Poznań, and Wrocław, Łódź falls behind not only in terms of the prestige of its universities but also in terms of the city's reputation as an urban area affected by the political transformation of 1989 and struggling with numerous problems, among which the aesthetic value of the urban space and the cultural offer corresponding to the needs of young people seem to be neglected. Another problem of Łódź is its rather unattractive labour market, including the average gross monthly salary. In 2019, the average gross monthly salary in Łódź amounted to PLN 5,200, which fell well short of the averages for Wrocław - PLN 5,800, Kraków - PLN 5,900, Gdańsk - PLN 6,200, and Warsaw - PLN 6,800. This discrepancy has a significant impact on the choice of university among high school graduates and their career prospects in the respective regions. At the same time, unquestionable advantages of Łódź include low costs of living when compared to other academic centers, as well as its transport accessibility thanks to the city's location in the center of Poland.

Labour market

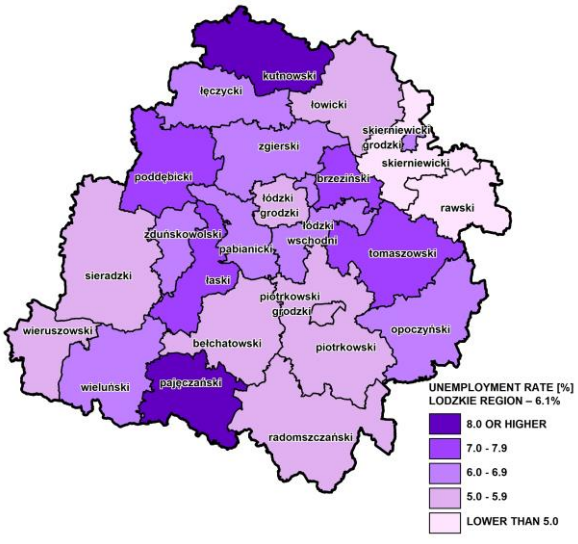
Challenge: Increasing the professional activity of the population and mitigating the effects of the widening generation gap on the labour market

The **high quality of human capital,** understood as the level of education and competences of the inhabitants, is of key importance to the attractiveness of any labour market. Easy access to qualified employees directly translates into the Lodzkie Region's ability to attract investors. Consequently, a reverse relationship develops: a highly competitive labour market increases its impact and attracts new workers from ever more distant locations.

The **economic structure of the Lodzkie Region is diversified in terms of sectors and space, in which agriculture and industry continue to play an important role** (providing work for 17.4% and 27.5% of all employees in the region, respectively), and their share in the number of employees is higher than the national average. On the other hand, the share of those employed in the services sector according to the Polish Classification of Business Activity (PKD) is lower than the national average and amounts to 55.1%. Changes in the structure of employment in 2010-2019 indicate an **increase in the importance of services** (by 3.11 p.p. for the entire services sector according to the PKD classification), especially at the expense of the agricultural sector.

Fig. 16. Registered unemployment rate in the Lodzkie Region in 2020.

Source: own work on the basis of the Local Data Bank of Statistics Poland



The economic potential and labour market attractiveness of Polish regions is strongly influenced by their capitals. As the third largest city in Poland by population, Łódź is the fifth largest labour market (behind Warsaw, Kraków, Wrocław and Poznań).

In 2019, the average **professional activity rate** for the working age population[58] in Poland amounted to 77,1%. With a score of 78.9%, the Lodzkie Region ranked relatively high (5th in the country). Between 2010 and 2019, there was a significant improvement in the labour market situation, coupled with an increase in the professional activity rate, however this growth was still lower than the national average (the Lodzkie Region increased by 4.6 p.p., against the national average of 5.5 p.p.).

As of 2020, the **registered unemployment rate** in the region was 6.2% (7th in Poland *ex aequo* with the Lubuskie Region) and was virtually identical with the national average (6.2%)**.**[59] In relation to 2019, an increase in unemployment by 0.8 p.p. was recorded (with the national average increasing by 1.0 p.p.), which was most likely caused by the economic difficulties triggered by the COVID-19 pandemic. One characteristic feature of the Lodzkie Region is its low intra-regional variation (the difference between districts with the lowest and highest unemployment rates in 2020 was 4.6 p.p.).

Individuals who remain outside of the labour market and are in a particularly difficult situation in terms of their employment opportunities, include primarily women returning to the labour market, persons with disabilities, persons with low professional qualifications, persons aged 50 or more, young persons under 25 years of age, including the NEETs.[60] According to the Eurostat data, in 2019 young NEET persons aged between 15 and 24 constituted 7.6% of the population of the Lodzkie Region and 8.1% of the population of Poland in this age bracket (compared with the EU average of 10.1%). However, in the 20-34 age category, this ratio rose to as much as 16.1% (EU - 16.4%), i.e. one in six Poles in this age group was neither studying nor working.

One significant threat to the labour market is the emerging generation gap, caused by the aging of society and the growing post-working age population. According to estimates, **by 2025 Poland's labour market may be short of as many as 1.5 million employees.**[61] Due to the intensifying unfavorable demographic processes, this problem may be particularly acute in the Lodzkie Region.

Social Capital

Challenge: Low levels of trust, social ties, relational capital and sense of identity

The region is characterized by an **upward trend in the level of social trust and cooperative capacity**, nonetheless in many aspects the Lodzkie Region ranks well below the national averages. Social cohesion surveys[62] indicate that the inhabitants of the Lodzkie Region declare trust in other people at the level of 78.4% (12th in the country, up from 16th in 2015). The level of associational capital (participation in various types of organisations) has also increased from 14% in 2015 to 20.2% in 2018 (up from 15th to 7th). High levels of family capital were declared by 30% of the region's population (11th in the country), and social-neighborhood capital by 24.1% of the population (12th in the country).[63]

One of the indicators used to assess the **level of civic activity** is the election turnout rate. In 2018, the local elections in the Lodzkie Region recorded **one of the highest election turnout rates** in the country - 57.0% (2nd, national average: 54.9%)[64]. Another indicator is the number of non-governmental organisations. In 2019, 35 **NGOs** per 10,000 population were registered in the region (14th in the country, national average: 38). The weakness of the third sector lies in its uneven development, a small number of members per organisation/association, and a low number of volunteers.

[58] As per the Research of Economic Activity of Population (BAEL) results. The professional activity rate was calculated as the percentage share of professionally active working age population in the total working age population. Working age in Poland is set at 18-64 for men and 18-59 for women.
[59] Statistics Poland data as of the end of December 2020.
[60] NEET (not in employment, education or training) is a young person aged 15-29 who meets each of these three conditions.
[61] https://www.pwc.pl/pl/media/2019/2019-01-22-luka-rynek-pracy-2025-pwc.html
[62] Regional variation in quality of life in 2018. Results of the Social Cohesion Survey. Statistics Poland, 2018.
[63] The social capital index indicates the level of participation in all types of organisations. A high family capital index indicates the strongest family bonds, while a high social-neighborly capital index tells indicates the highest level of family/social-neighborly contacts, ensuring the capacity for material and spiritual support. As of 2018, 24.1% of the region's population represented high or very high levels of social-neighborly capital, with 34.1% at the medium level, 30.1% at the low level, and 11.6% at the very low level/no relationships level. High levels of family capital characterized 30% of the region's population, with 46.4% at the medium level, 20.1% at the low level, 3.6% at the very low/no family relationships level.
[64] https://wybory2018.pkw.gov.pl/pl/frekwencja/2110#f1000000

The recent years have brought a revival of **folk traditions** and their cultivation. There is a growing popularity of regional folk festivals and regional products. The cultural sub-regions with the participation in folklore activities are those of Łowicz and Opoczno. Traditional culinary arts and food products play an important role in the development of regional identity. Over the recent years, the number of traditional products from the Lodzkie Region has increased. The List of Traditional Products[65] features a total of 1,996 products, including 151 specialties from the Lodzkie Region (7.6% of the total, 6th in Poland).

Fig. 17. Number of non-governmental organisations per 10,000 population in the Lodzkie Region districts in 2019.
Source: own study based on Statistics Poland data

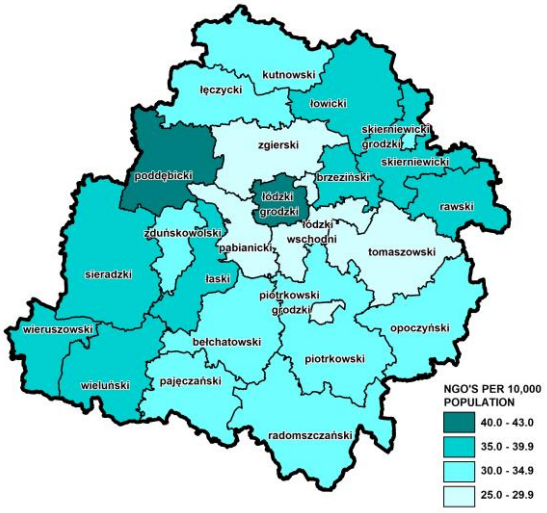
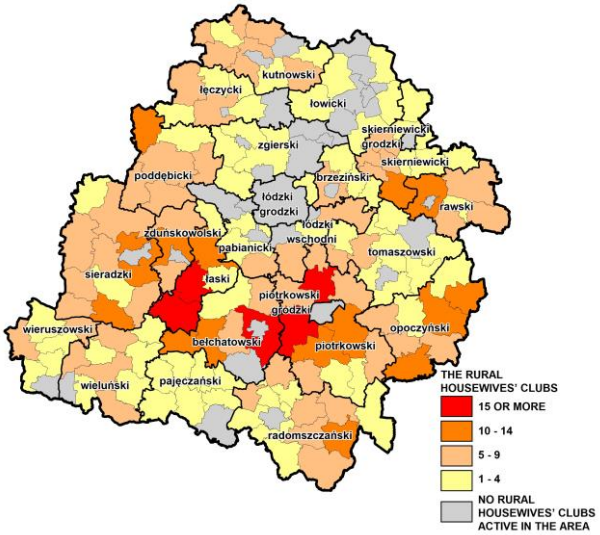


Fig. 18. Rural Housewives' Clubs conducting business activities in 2019.

Source: own study based on National Register of Rural Housewives' Clubs data



Among others, the activity of **Rural Housewives' Clubs** supports the cultivation of folklore and traditions, integration of local communities, and development of women's entrepreneurship.[66] As of 2020,[67] 9,009 clubs were registered in the National Register of Rural Housewives' Clubs, including 787 in the Lodzkie Region (5th among all Polish regions). Apart from Rural Housewives' Clubs, an important role in the cultivation of folklore and traditions is played by **Voluntary Fire Brigades**, which, apart from their basic function (protecting local residents and counteracting dangers) facilitate the integration of residents from all age groups. In 2019, there were 1,451 Voluntary Fire Brigade units operating in the region.

Strengthening the sense of **regional and local identity** has a significant impact on the development of social capital. It is based on the traditions and heritage of historical areas that gave rise to ethnographic cultural subregions: Łęczycki, Łowicki, Opoczyński, Rawski, Sieradzki (with Piotrkowski) and Wieluński - with their characteristic manifestations of folklore; and the Łódź subregion, with its specificity dating back to 19th-century industrial traditions based on multicultural potential. Their history, traditions, and culture contribute to the development of the identity of their residents, and thus help them bond with the inhabited area. This rich culture and traditions require protection, dissemination, and promotion.

Another valuable initiative involving residents in the affairs of local communities is the **civic budget**. In 2020, the fourth edition of the civic budget for the Lodzkie Region named "ŁÓDZKIE NA PLUS" was held. It is due for implementation in 2021. The last edition of the budget attracted a total of 59,546 voters, who chose 6 tasks to be implemented from the regional pool, amounting to a total of PLN 3 million, and 105 projects from the district pools amounting to a total of PLN 3 million.[68] The civic budget is also implemented at the city level - in the years 2013-2019 it was implemented in 21 towns and cities in the Lodzkie Region.

The village fund includes funding guaranteed in the commune budget for the implementation of projects to improve the living conditions of residents, however its creation is not mandatory. In terms of the amount spent

[65] https://www.gov.pl/web/rolnictwo/woj-lodzkie
[66] In accordance with the Act on Rural Housewives' Clubs dated 9 November 2018 (Journal of Laws 2018, item 2212).
[67] https://krkgw.arimr.gov.pl/#, (as of 4 March 2020).
[68] https://bo.lodzkie.pl/wyniki-glosowania/

under the village fund in 2019, the Lodzkie Region ranked 10th in the country. Village Grants is a program of the Self-Government of the Lodzkie Region, intended to extend financial assistance from the budget of the Lodzkie Region to local government units from the region. The grants have been awarded to 302 projects (whose total value amounted to PLN 3 million), to be implemented in 154 communes across the region.[69]

Building trust, social ties and relational capital[70] translates into a **sense of security of the region's residents**, which should be considered not only through the lens of the activity of uniformed services' (e.g. police, fire department) operations but also based on the level of crime, road traffic safety, fire protection. According to Statistics Poland, in 2019 the Lodzkie Region ranked 8th nationally in terms of crime detection rate (with a rate of 5.7%), and in terms of the number of road accidents (3,351), it ranked 2nd among all regions.[71] In terms of fire protection in 2019, a total of 34,039 incidents were recorded in the region[72] (6th in the country).

Culture and recreation

Challenge: Insufficient level of use of the cultural and recreational offer

Culture and its institutions have a creative function in relation to social capital. Participation in cultural events and initiatives is of crucial importance in this respect, because it **strengthens the sense of community and identity**. **Cultural events** can be organized, among others, in cooperation with libraries, community centers, theaters, cinemas, museums, creating a space for exploration and inspiration and a meeting place for different age and professional groups.

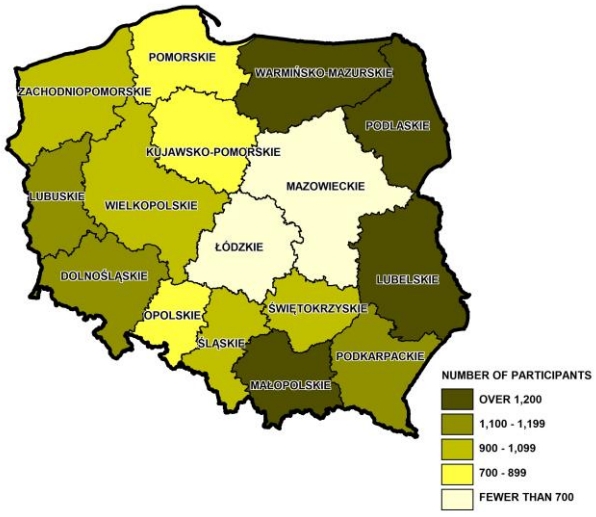
In 2019, 46 museums including their respective branches conducted museum activities in the Lodzkie Region (9th in the country). Despite the increasingly attractive offer of these institutions and the increasing number of visitors, the Lodzkie Region was only ranked 10th in Poland in this respect.

There were 11 theaters and musical institutions in the region (7th in the country), but despite the increase in the number of spectators and listeners, the Lodzkie Region was only ranked 10th in Poland in this respect.

In 2019, there were 204 **cultural centers** and establishments, houses, clubs and community centers active in the Lodzkie Region (12th in the country), however the region ranked last in the country in terms of the **number of participants** in events organized by these institutions per 1,000 residents (Lodzkie Region 657, Poland 977). Moreover, in 2019 there were 500 **libraries** and branches (8th in the country) with the number of **readers** amounting to 149 people per 1,000 inhabitants (8th in the country).

Residents of large cities have the greatest access to cultural institutions. Residents outside large agglomerations have limited opportunities to participate in institutional cultural life, as they grapple with obstacles that include problems with transportation to venues and lack of financial resources.

Fig. 19. Participants of events organized by centers of culture, cultural centers and establishments, clubs and community centers per 1,000 population in 2019.
Source: own study based on Statistics Poland data



In addition to traditional participation in events organized by cultural institutions, other **forms of cultural activity** have been gaining importance as of late. They are related, among others, to the development of digital technologies (e.g. browsing museums' collections online,

[69] https://www.lodzkie.pl/rolnictwo/dotacje-dla-gmin-projekty-w-so%C5%82ectwach/dotacje-w-2020-roku
[70] Relational capital should be understood as the ability to build, maintain and strengthen relationships and cooperation.
[71] Annual Report "Traffic Accidents in Poland in 2019," Police Headquarters, Traffic Bureau, p. 8.
[72] Of the total of 34,039 incidents, 28.4% were fires, 63% local hazards, such as those related to road transport, high winds and medical incidents, and 8.6% were false alarms. (Activities of emergency services in 2019, Statistics Poland).

listening to audio books, writing blogs), as well as the ongoing social and cultural changes. The activities of historical reenactment groups, meetings of neighborhood associations or rural housewives' clubs play an increasingly important role in local communities. In addition, residents willingly participate in festivals (harvest festivals, town and commune celebrations) or open-air concerts.

Sports, recreation and tourism activities play an important role in creating the recreational offer. The popularity of active leisure among the region's residents has been on the rise, which has a significant impact on the development of sports infrastructure. Between 2010 and 2018, the number of sports facilities[73] in the Lodzkie Region increased from 655 to 987, ranking 9th in the country. A significant number of sports facilities have been adapted to the needs of persons with disabilities, both active participants and spectators.[74] Also observed was an increase in the number of sports and recreation clubs (from 794 to 904) and the number of persons exercising (from 49,539 to 62,861), placing the Lodzkie Region 7th among all Polish regions.

The crisis caused by the COVID-19 pandemic has affected both the level of participation and the manner of participation in culture, tourism, sport and recreation. The use of Internet tools has definitely increased, which has created new opportunities for participation in culture and increased the availability of culture on the Internet.

Demographics

Challenges: Aging society and ongoing depopulation

The Lodzkie Region is characterized by a dire demographic situation. Since 2010,[75] the population of the region has decreased by 97.8 thousand (3.8%) and the depopulation rate is one of the highest in the country. The main reason behind the depopulation of the region is the **natural decrease in population** (Lodzkie Region -3.6‰; Poland -0.9‰), which results from a high number of deaths and low number of births. After a period of decline in birthrate in 2010-2015, starting from 2016 there has been an increase in births, which may have been spurred by the passing of the 500+ program, among other factors. The region is also characterized by a significant outflow of population due to **migration** (Lodzkie Region -1.0‰; Poland 0.2‰).

Fig. 20. Percentage change in population in communes between 2010 and 2019 [2010=100%]

Source: Own study based on Statistics Poland data

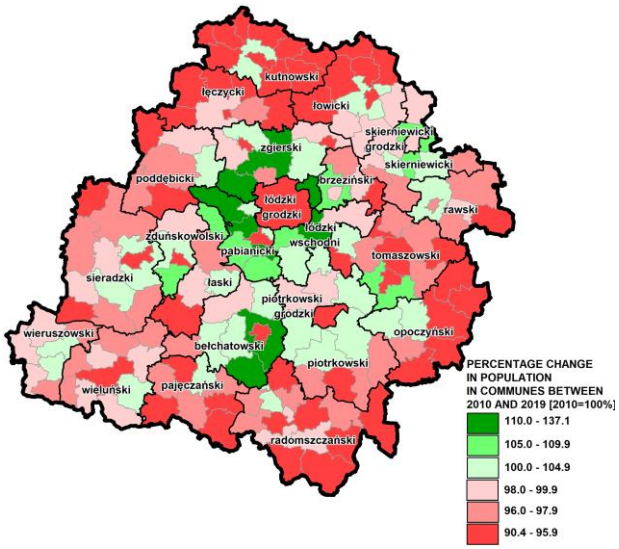
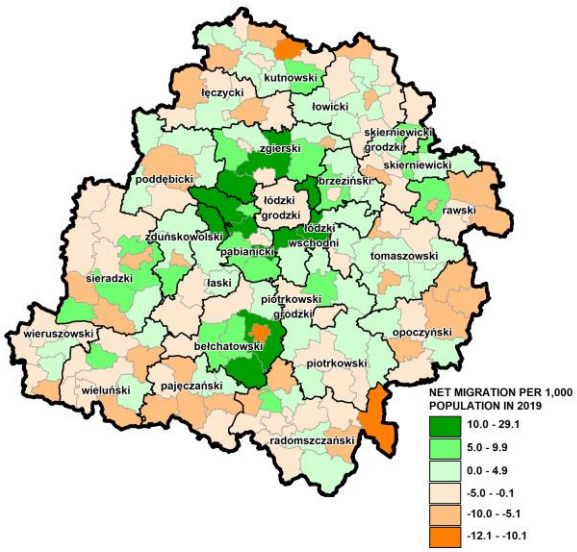


Fig. 21. Net migration in the Lodzkie Region communes in 2019.
Source: Own study based on Statistics Poland data



[73] The number of sports facilities in 2018 encompassed stadiums (120), playing fields (616), including football pitches (354), basketball courts (45), handball courts (6), volleyball courts (29) and universal/multipurpose fields (182), sports gyms with minimum dimensions of 36x19 m (62), tennis courts (indoor and outdoor, 160) and indoor swimming pools (29).

[74] The number of sports facilities in 2018 adapted to the needs of persons with disabilities (participants/spectators) was as follows - stadiums: 36/55, sports gyms with minimum dimensions of 36x19 m: 42/37, indoor swimming pools: 13/12.

[75] Data for the first half of 2010 and 2020, respectively.

In the period between 2010 and 2019, out of 177 communes in the region, as many as 129 saw a decline in population. The fastest depopulation was observed in cities - by the end of 2019 the number of urban residents in the region decreased by 5.7% in comparison to 2010, and almost all cities experienced depopulation.

A **demographic forecast published by Statistics Poland (GUS)** indicates that the depopulation process in the Lodzkie Region will continue and by 2030 its population will have shrunk by another 117,700 (4.8%), which will be one of the fastest depopulation rates in Poland. The largest absolute number of people will be lost in Łódź (59.2 thousand), with significant changes noticeable in Bełchatów (6,700), Pabianice (5,400) and Tomaszów Mazowiecki (4,900), which translates into population declines ranging from 8% to 12% compared to 2019. The depopulation of cities will largely take place in favor of the adjacent rural areas. It is projected that by 2030 the population of cities and urban-rural communes of the region will decrease by about 118,300 (6.9% of the total population of cities and urban-rural communes), while rural communes are projected to increase, but only by 600 residents (0.1% of the total rural population).

Fig. 22.: Demographic dependency ratio (number of post-working age population per 100 persons of working age) in 2019

Source: Own study based on Statistics Poland data

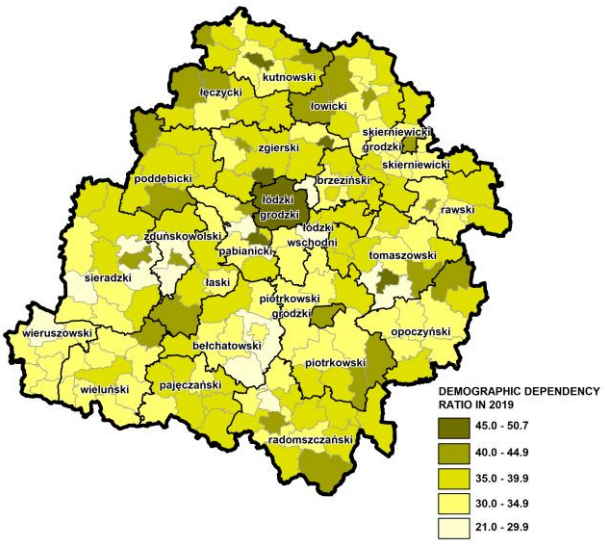


Fig. 23. Communes with the most difficult demographic situation in 2030

Source: Own study based on Statistics Poland data

The region is also characterized by **adverse changes in the age structure** of the population related to aging. It has recorded one of the lowest shares of population in pre-productive age (17.0%; 14th in Poland in 2019) and the highest share of population in post-working age (24.3%; 1st in the country), resulting in the **highest demographic dependency ratio value in the country**, amounting to 41.3 persons in post-working age to every 100 persons in working age in 2019 (Poland 36.5). The most dire situation in this respect has been observed in Łódź (50.7), with the Bełchatowski district at the opposite end of the spectrum, with the largest percentage of people in working age (32.2).

According to the demographic forecast of Statistics Poland, the situation will continue to deteriorate. By 2030, the demographic dependency ratio in the region is projected to reach 49.1, with the worst situation expected in cities, and the lowest values of the demographic dependency ratio in the rural areas of the southern and eastern part of the region. The most serious problems in the 2030 perspective will occur in those communes that will experience the highest projected decline in population, combined with the highest dependency ratio. Most vulnerable in this respect will be the peripheral areas of the region, especially in its north and south-east parts, as well as the largest cities - Łódź and Piotrków Trybunalski. One should also keep track of the situation in Bełchatów, which in the 2010-2030 perspective is projected to record the largest negative changes in the dependency ratio, whose value is expected to increase from 13 persons in post-working age per 100 persons in working age in 2010 to 57 persons in post-working age per 100 persons in working age in 2030.

Health

Challenge: Poor health of the residents of the Lodzkie Region

The Lodzkie Region is characterized by poor health of its residents, which is reflected by one of the highest death rates from civilisation diseases in Poland. One of the factors contributing to this state of affairs is the demographic situation, and in particular the phenomenon of "demographic old age." With the highest percentage of post-working age population in the country, the Lodzkie Region faces high death rates, given that it is mainly seniors who succumb to and die of civilisation diseases. In 2018, in terms of **cancer-related deaths**, the Lodzkie Region was ranked 1st in the country (Lodzkie Region 316.3/100,000; Poland 284.5), and 3rd in terms of deaths caused by **cardiovascular diseases** (Lodzkie Region - 488.8/100,000; Poland 437.2). In 15 out of 24 districts, cancer mortality was higher than the national average. In 2018, the region also ranked at or around the top in terms of deaths caused by **external causes** (1st in the country), **respiratory diseases** (1st in the country), **gastrointestinal diseases** (2nd in the country) and **unexplained causes** (5th in the country). Despite a decline in the number of deaths due to **cardiovascular diseases** in the Lodzkie Region between 2010 and 2018 (by 15.0%), cancer mortality nonetheless increased by 8.9%.

Neurological diseases of old age were a crucial cause of death, ranking 3rd as the most frequent cause of death[76] in the Lodzkie Region. A significant upturn in the number of elderly people, who often experience multiple health problems and disabilities, increases the demand for various types of health services and benefits for this population group and calls for a reorganisation of healthcare in this respect.

Mental disorders are another serious health problem in the Lodzkie Region - the region ranks 4th in Poland in the **incidence of mental illnesses and disorders** and leads the country in terms of employee sick leaves on this account. In total, 90,340 people were treated in mental health clinics in the Lodzkie Region in 2018. In addition to mental disorders, **psychoactive substance abuse** is also a problem, especially the so-called "legal highs." In 2018, the number of suspected poisonings with legal highs amounted to 1,094, which (per 10,000 inhabitants) was the highest result among all Polish regions.

Fig. 24. Number of suspected poisonings with legal highs per 100,000 population in 2018.

Source: own study based on data from the Chief Sanitary Inspector

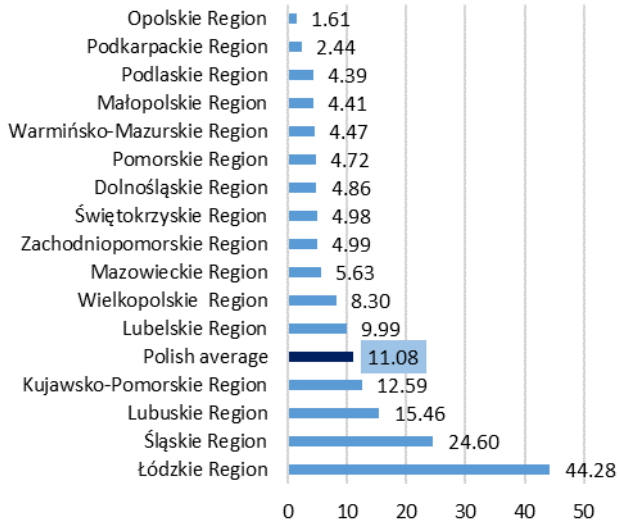
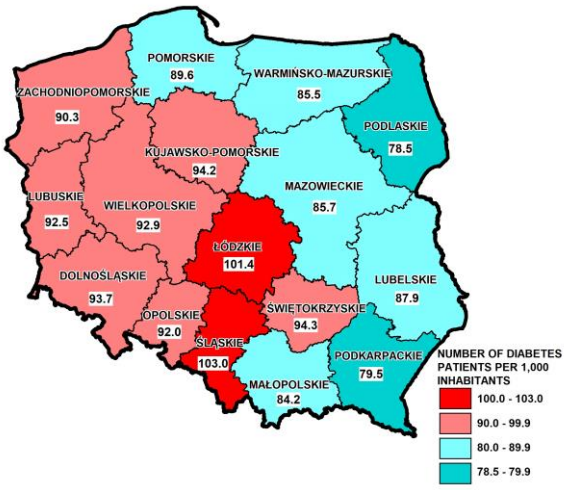


Fig. 25. Number of diabetes patients per 1,000 population

Source: Own study based on the "NFZ about health. Diabetes" report, Warsaw 2019



Another disease that affects an increasing number of people is **diabetes.** Diabetes belongs to the group of civilisation diseases, and untreated or poorly treated leads to serious health complications. In Poland, the rate of adult population with diabetes increased from 7.9% in 2013 to 9.1% of the total population over 18 years of age in 2018. In 2018, the highest relative number of diabetes patients was recorded in the Silesian *(Śląskie)* (103/1000

[76] Data based on the "Map of health needs in hospital treatment for the Lodzkie Region."

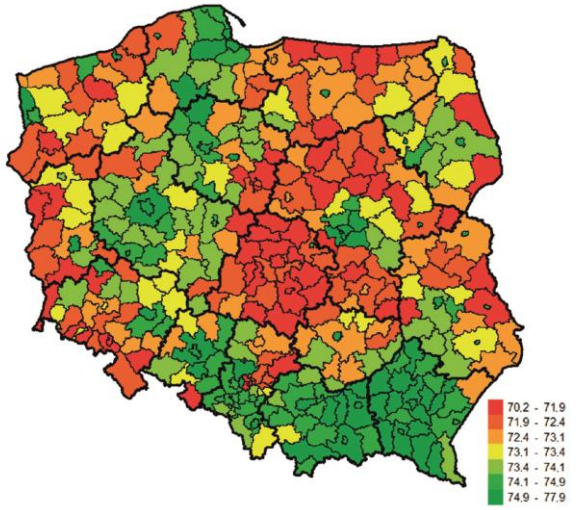
population) and the Lodzkie (101.4/1000 population) regions, while the lowest number was observed in the Podlaskie (78.5/1000) region.

The Lodzkie Region is characterized by high **over-mortality among men** of working age, especially in rural areas, and a **large difference in the life expectancy of men and women**. According to 2019 data, both men and women in the Lodzkie Region have the shortest life expectancy in the country: men - 72.5 years (Polish average- 74.1 years), women - 81.0 years (Polish average - 81.8 years). Among Poland's 25 districts with the shortest life expectancy for men, as many as 7 are located in the Lodzkie Region (City of Piotrków Trybunalski, and the districts: Kutnowski, Piotrkowski, Zduńskowolski, Łaski, Radomszczański, Tomaszowski); for women, there are two such districts (City of Łódź, City of Piotrków Trybunalski).

Health problems of the working-age population in the Lodzkie Region have a negative impact on the labour market. These problems especially affect people over 50 years of age, among whom as many as 83% suffer from at least one chronic disease. In 2018, the rate of **sick leave days** per insured employee in the Lodzkie Region was 18.4 days, which put the region at the top of all regions in terms of the sick leave rate.[77]

Fig. 26. Male life expectancy in 2015-2017 by district of residence

Source: "Sytuacja zdrowotna ludności Polski i jej uwarunkowania" eds. Bogdan Wojtyniak, Paweł Goryński; National Institute of Public Health - National Institute of Hygiene, 2018.



The **impact of air pollution on population health and death rate** has been increasingly stressed. Smog (low particulate matter) emitted from chimneys of houses heated by poor quality fuels is particularly hazardous for health. Among the 50 most polluted cities in the European Union, most are located in Poland, including 7 in the Lodzkie Region (Opoczno, Rawa Mazowiecka, Radomsko, Tomaszów Mazowiecki, Piotrków Trybunalski, Zduńska Wola, Brzeziny).[78]

The OECD estimates that around one third of the total health burden can be attributed to lifestyle-related behavioral risk factors. In terms of **healthy lifestyle and health-promoting behaviors**, the inhabitants of the Lodzkie Region fell behind than the national average with respect to such behaviors as smoking, insufficient intake of fruit and vegetables, and low enrolment in population screening tests financed by the National Health Fund. Overweight and obesity were present in 49.8% of the population in the Lodzkie Region (with the national average sitting at 45.7%), however in terms of the percentage of population abusing alcohol and the number of teetotalers, the presence fared better than the national averages.

Physical activity has a key impact on physical and mental health, but adult Poles are less physically active than most EU citizens. Only 28% of them engage in sports activities (EU-wide average - 40%), and about 60% declare no physical activity outside of work.

Healthcare services

Challenge: Unequal and inadequate availability of healthcare services

The Lodzkie Region stands out in comparison to the rest of the country when it comes **to its relatively good healthcare infrastructure and the number of staff working in the healthcare sector**. According to Statistics Poland, at the end of 2019 there were 63 general hospitals in the Lodzkie Region, of which 10 were organized by the regional authorities of the Lodzkie Region. In terms of the number of hospital beds, the region ranked 3rd in the country, with an indicator of 47 beds per 10,000 residents (Poland - 43.0). The indicators related to the number

[77] Sickness Absenteeism in 2018. Department of Statistics and Actuarial Projections of the Social Insurance Institution, Warsaw 2019.
[78] Source – WHO, 2019.

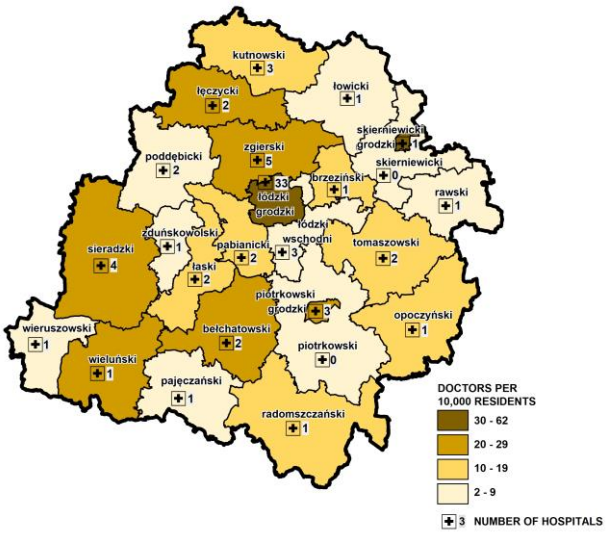
of outpatient clinics per 10,000 inhabitants (1st in the country and access to pharmacies (4th in the country) were also favorable. The main problem lies in the uneven distribution of healthcare resources, including medical staff and infrastructure.

In light of the demographic changes associated with aging populations, the **availability of long-term care is also becoming a crucial factor**. Only 12.3% of Poles aged 65+ are satisfied with their healthcare services (OECD average - 44%). Given that it is the region with the oldest age structure, the Lodzkie Region ranked 9th in the country in 2019 in terms of the number of beds in nursing and care facilities and hospices per 100,000 residents. Seven districts were completely devoid of any long-term care facilities. The region also has burning needs related to the provision of access to various forms of community care, including long-term nursing care provided for the chronically ill at home.

In terms of the **number of doctors** per 10,000 inhabitants, the region was ranked 1st in the country in 2019 with 29 (with the Polish average sitting at 24), however staffing shortages for both medical staff and nurses are becoming more acute, and the current COVID-19 pandemic has only brought them to the fore. Particularly important - given the need to treat mental disorders - is the shortage of working **psychiatrists.**

Fig. 27. Doctors per 10,000 population; number of hospitals in 2019.

Source: Own study based on Statistics Poland data



In 2019, there was a total of only 168 psychiatrists (0.68 per 10,000 residents), 23 child and adolescent psychiatrists (0.09 per 10,000 residents), and 753 psychologists (1.4 per 10,000 residents) in the Lodzkie Region).[79] Another significant problem is the insufficient number **of geriatricians**. There were 0.06 geriatricians per 10,000 residents in the Lodzkie Region in 2019. It should be noted that geriatric beds in 2019 were located in as few as 2 hospital wards in Łódź and Zgierz, respectively. Problems with access to medical services mainly affect rural areas and small towns. Thus, the use of digital technologies and the widespread use of e-services are becoming increasingly important in the sector of healthcare services.

Poverty and social exclusion

Challenge: Persistence of areas of poverty and social exclusion

Despite the above-average situation regarding poverty when measured against the rest of the country, there are areas and social groups in the Lodzkie Region that are particularly affected by this phenomenon. According to Statistics Poland, in 2019 3.3% of the residents of the Lodzkie Region, i.e. about 81 thousand people (Polish average - 4.2%), lived below the extreme poverty line.[80] That same year, **10.0% of the inhabitants of the Lodzkie Region, i.e. about 245 thousand people** (Polish average - 13.0%), **lived below the relative poverty line.**[81] In the years 2015-2019, the Lodzkie Region saw a significant decrease in extreme poverty (from 5.4% to 3.3%) and relative poverty (from 12.3% to 10.0%). This was possible, among others, thanks to significant social transfers (500+, "thirteenth pensions").

In addition to the poverty rate, the economic condition and living conditions of the population are also determined by the income earned, the standard of housing, and access to public services. In terms of the income

[79] The Lodzkie Region Healthcare Statistical Bulletin, 2019, p. 121.

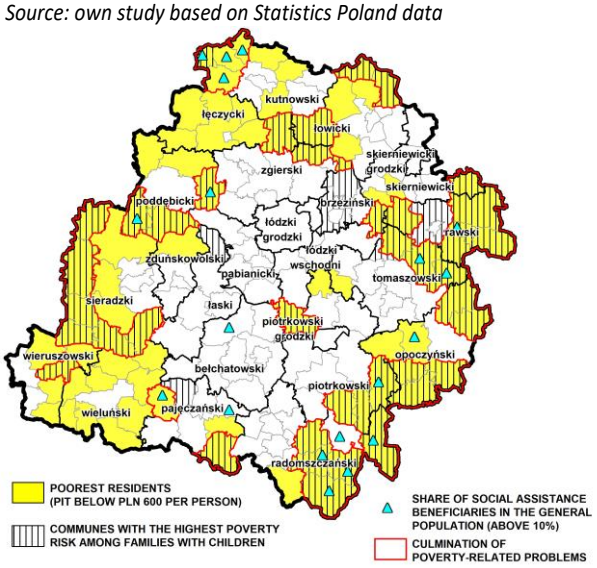
[80] Percentage of people in households where the level of expenses was lower than the extreme poverty line (subsistence minimum), which defines the minimum level of satisfaction of human needs, below which human life and psychophysical development are biologically threatened.

[81] Relative poverty denotes the amount equal to 50% of the average monthly household expenditure.

situation, in 2019 average salaries in the Lodzkie Region were lower than the national average (sitting at 92.4% of the said average); so were its pension and disability benefits (sitting at 90.8% of the average national pension and 84.1% of the average national pension for those insured in the non-agricultural insurance system, respectively), while also observing a lower percentage of population using social assistance benefits than nationally (Lodzkie Region - 312.7/10,000; Poland - 314.0/10,000); however, the region also had the largest ratio of persons who opted out of medical care due to insufficient financial resources (as of 2014).[82]

The Lodzkie Region is characterized by a favorable ratio of dwellings per 1,000 inhabitants (Lodzkie Region 420.5; Poland 385.9), but the rate of completion of new dwellings is lower than the Polish average - 2.0 dwellings per 1,000 inhabitants were built in 2019 in the region (against the Polish average of 2.2). Another problem is the **low standard of some dwellings**. This applies in particular to old pre-war tenements in urban areas, especially in Łódź (over 37,000 apartments, i.e. 10.7% of all apartments in the region, are not equipped with a bathroom; and over 65,000 apartments, i.e. 19% of all apartments in the region, have no central heating) and rural areas, where 25.3% of apartments do not have a bathroom, and 35% do not have central heating. Housing problems mainly affect families with low and average incomes and persons at risk of poverty and social exclusion.

Fig. 28. Communes affected by a high rate of poverty in 2018.
Source: own study based on Statistics Poland data



Another significant problem is **energy poverty**, which in 2017 affected 12% of residents across the region (and 9.8% of all Polish residents); the problem mainly affected those living in single-family houses and residents of old tenement houses. The risk of multidimensional energy poverty is much higher among households living on social benefits and living in single-family houses; it also more frequently affects those living in rural areas.[83] As many as one in ten households in the Lodzkie Region faces energy poverty, most acutely so in the Skierniewice sub-region.[84]

Another area related to poverty and social exclusion is **transport exclusion**. Residents (mainly those based in villages and small towns) without a driver's license and a car face serious problems with respect to getting around and accessing services, especially so among senior residents. This state of affairs is, among others, caused by the lack of sufficient network of public transport routes.

Seniors are also the social group most vulnerable to **digital exclusion** - among people aged 65 and over, only 26% were Internet-literate in 2019.[85]

The areas most acutely affected by the social problems leading to exclusion are **degraded urban areas** that require comprehensive revitalisation, especially socially. It is there that unfavorable phenomena accumulate such as, among others, permanent unemployment, substance abuse, helplessness and passivity, dependence on social assistance.

In 2019, almost 147,500 residents of the Lodzkie Region received **social assistance**. The largest part of the group constituted of people requiring support due to long-term or severe illness (support was extended to 51.7%

[82] Health and health behaviors of the Polish population in light of the European Health Interview Survey 2014, Statistics Poland 2015.
[83] Sokołowski J., Lewandowski P., Kiełczewska A., Bouzarovski S. 2019 Measuring energy poverty in Poland with the Multidimensional Energy Poverty IndeX, IBS Working Paper 07/2019.
[84] "Energy Poverty in Lodzkie Region," Regional Social Assistance Center in Łódź, 2020.
[85] Center for Public Opinion Research survey conducted in 2019.

of families who benefited from social assistance), poverty (41.5% of families receiving benefits), unemployment (39.6%), and disability (39.8%).[86]

The scope of reliance on social assistance benefits based on income criteria[87] demonstrates the **scale of economic poverty** among residents of the Lodzkie Region. Districts and communes with the highest percentage of people benefiting from social assistance are concentrated along the north-western and south-eastern borders of the region. The introduction of the 500+ child support benefit in 2016 significantly reduced the scale of poverty nationally, especially in families with dependent children. In 2018, 219,787 children, i.e. 51.7% of all children and young people under 18 years of age in the region (Poland - 52.6%), received the 500+ child support benefit in the Lodzkie Region.

Among those most vulnerable to **social exclusion** are the persons with disabilities, the chronically ill, persons experiencing long-term unemployment, persons in need of support in everyday life,[88] and persons experiencing homelessness.

According to the National Census 2011, there were 333,800 persons with disabilities living in the Lodzkie Region[89] (13% of the total population; Polish average - 12%). Despite the existing support system for persons with disabilities in Poland, the vast majority remain economically inactive. The employment rate of persons with disabilities aged 16-64 in 2019 was 30.1% for the Lodzkie Region (with the national average sitting at 24.8%).

The group of **people in need of support in everyday functioning, particularly those exposed to multidimensional exclusion**, consists of children with congenital disabilities; a group of many thousands of adults injured as a result of severe accidents and injuries; and, above all, seniors burdened with multiple chronic diseases.

In order to counter exclusion in 2018, the "Accessibility plus" 2018-2025 program was launched in Poland. The program is addressed not only to persons with disabilities, but also the elderly, pregnant women and mothers with children, seeking to help remove accessibility barriers (infrastructural, architectural and legal ones).

In 2019, there were 30,300 homeless persons nationwide, of whom 1,788 resided in the Lodzkie Region.[90] In 2019, there were 23 facilities offering accommodation for homeless people in the region, which offered a total of 984 beds.

Social integration

Challenge: Insufficient access to infrastructure and services for social inclusion

Throughout 2019, a total of 7,203 residents,[91] i.e. 1.5% of people aged 65+, were covered by care services in the Lodzkie Region. Despite the ongoing aging of the population, **the number of people covered by care services remains relatively stable**. It is estimated that **the region is home to about 140,000 thousand people in need of support in everyday life**. According to the data of the Supreme Audit Office, almost 27% of communes in the region do not provide elderly people with care at their place of residence, although it is their statutory duty.[92]

One form of providing services at the place of residence is through day care centers. As of 2019, there were 90 day support institutions in the region, including 47 community self-help homes and 43 day care homes for seniors.

The dominant form of care for people in need of support in daily functioning, which is being abandoned in a number of European countries due to the deinstitutionalisation of social services, are **full-time residential**

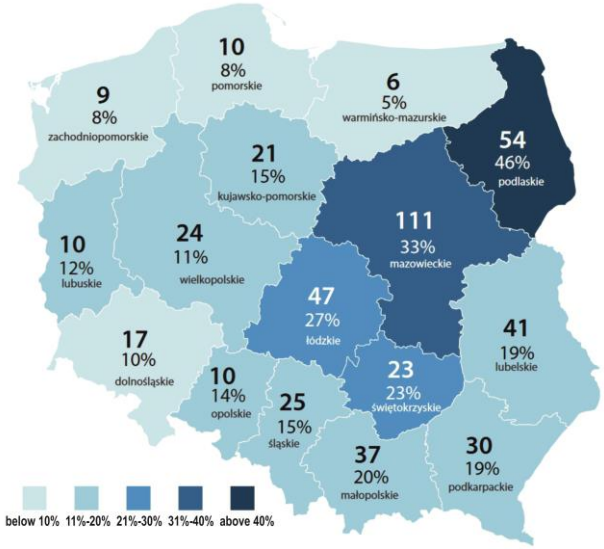
[86] The values provided do not add up to 100%, due to the fact that one family/person may have been helped on account of several reasons (source: "Assessment of social assistance resources of the Lodzkie Region for 2019").
[87] The income criterion to become eligible for social assistance checks in 2018 was the threshold of PLN 701 for single person households, and PLN 528 for family households.
[88] A person in need of support in daily life (formerly a dependent person) is a person who due to age, health condition or disability requires care or support due to their inability to perform at least one of the basic activities of daily life. Basic activities of daily life include: eating, dressing and undressing, personal hygiene, using the toilet, controlling physiological activities, moving around, and communicating.
[89] People with legal and biological disabilities. Persons with disabilities in the Lodzkie Region, Statistical Office in Łódź, Łódź 2014.
[90] Results of the National Survey on the Number of Homeless People - 2019 Edition, Ministry of Family, Labour and Social Policy.
[91] "Assessment of social assistance resources of the Lodzkie Region in 2019," Regional Center of Social Policy in Łódź, Łódź 2020.
[92] Information on the performance of the Supreme Chamber of Control audit "Care services provided to the elderly in their places of residence," 2018.

institutions (nursing homes - DPS). As of 2019, the Lodzkie Region was host to 67[93] nursing homes (including branches) and 32[94] facilities providing round-the-clock care for the disabled, the chronically ill, and the elderly.

Residential institutions - due to the fact that they house elderly, ill and disabled people - have proven to be particularly vulnerable to SARS-CoV-2 infections and deaths. In this context, **deinstitutionalisation of social assistance institutions** seems to be even more justified and necessary.

The **process of deinstitutionalisation** of services is most advanced **in the area of child care**, and the Act on Family Support and the System of Foster Care provisions the eventual establishment of small, intimate care and educational institutions, in which no more than 14 children over the age of 10 can be placed at the same time. In 2019, there were 2,848 family foster care entities (including foster families and family-type children's homes) in the region, caring for a total of over 4,159 children. On the other hand, 990 children were committed to care and educational institutions.

Fig. 29. Number and percentage of communes not providing care services at the place of residence
Source: Care for the elderly in selected inspections of the Supreme Audit Office, 2019



It is very important to support the family in fulfilling its caring and upbringing functions, among others through the development of services provided in the child's natural environment. As of 2019, there were 135 day-care centers for children and young people in the Lodzkie Region.

Fig. 30. Percentage of children aged 3 and below covered by nursery care in the Lodzkie Region in 2019
Source: Own study based on Statistics Poland data

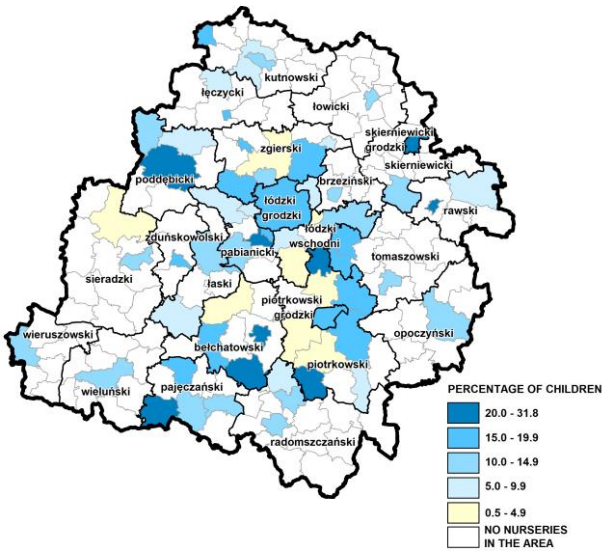
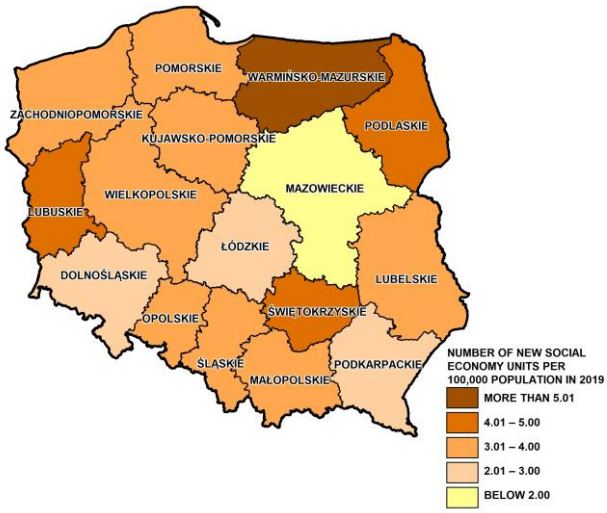


Fig. 31. Social and professional reintegration units per 100,000 population in 2019.
Source: Own study based on Statistics Poland data



Access to childcare facilities for the youngest children under 3 years of age and pre-school education facilities determines the scope of participation in the labour market, especially for women. As of 2019, the Lodzkie Region was host to 218 childcare facilities for children up to 3 years of age (nurseries, children's clubs, nursery branches). Over the period between 2017 and 2019, 68 new institutions were opened, among others thanks to

[93] Official Gazette of the Lodzkie Region dated 1 July 2020, item 3826. Circular No. 21/2020 of the Governor of the Lodzkie Region on the Register of Social Assistance Homes operating in the Lodzkie Region in 2020, dated 30 June 2020.
[94] Register of round-the-clock nursing homes for the disabled, the chronically ill, and the elderly. www.pomoc.lodzkie.eu accessed 6 November 2020.

the implementation of the government program "Maluch+". The deficit of nursery infrastructure is most evident in rural areas. One of the possible reasons for this situation[95] may be the low interest of parents in placing children in nurseries.

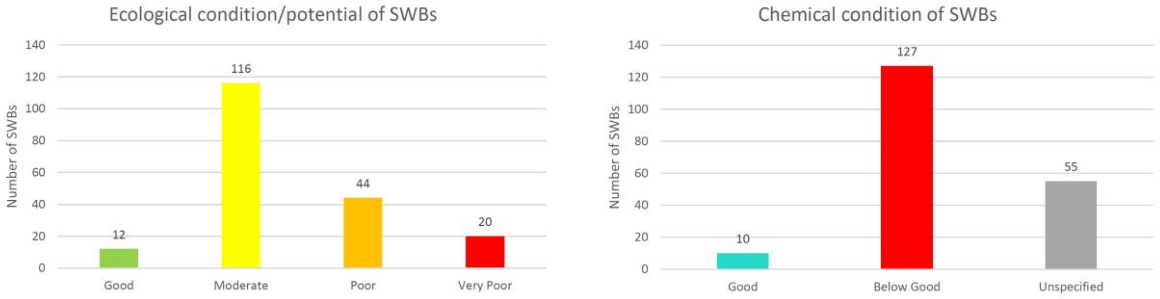
A key role in supporting the social integration of poor persons and persons at risk of social exclusion should be played by social economy entities and non-government organisations. The **social economy sector** consists, among others, of Occupational Therapy Workshops (OTW), Occupational Activation Works (OAW), Social Integration Centers (SIC) and Social Integration Clubs (SIC). In 2019, a total of 58 social reintegration entities operated in the Lodzkie Region, of which the most common one was the Occupational Therapy Workshop (41). In terms of the saturation of social reintegration entities per 100,000 population, the region was ranked 14th in the country (Lodzkie Region - 2.36; Poland - 3.25). There are also social enterprises operating in the Lodzkie Region that conduct commercial operations but at the same time support the social and professional integration of people at risk of social exclusion. In 2020, there were 77 social enterprises in the region, 24 of which were social cooperatives, and the rest operated under such legal forms as: foundations, associations, non-profit companies.[96] Despite such diversity, the social economy sector is not sufficiently developed in relation to the market demand.

Surface waters

Challenge: Low quality of surface waters

Surface waters of the Lodzkie Region are **heavily polluted** and their quality has deteriorated in recent years. In 2014-2019, poor water status was diagnosed for 95.3% of the 192 total surveyed Surface Water Bodies (SWBs).[97] The poor status of most rivers in the region is due to their low ecological status or potential and chemical status. The most polluted rivers include: the Bzura (old riverbed), the Łódka, the Jasień, the Łęka-Dobrogosty and Strzegociński Canals, the Ner (from the Dobrzynka to the Zalewka), the Pichna (from the Urszulinka to the mouth), the Pilica (from the Sulejów Reservoir to the Wolbórka River), the Warta (from the Jeziorsko Reservoir to the Siekiernik) and the Wierznica. Among the studied water bodies, only 12 were characterized by good ecological status/potential; 116 were characterized by moderate status, and the remaining 64 by poor or bad status. The majority of the region's surface water bodies were characterized by a poor chemical status (127), and only 10 ranked satisfactory in this regard (55 water bodies were not included in the classification).[98]

Fig. 32. Ecological and chemical condition of water bodies in the years 2014-2019
Source: own study based on the "Assessment of the status of water bodies of rivers and dam reservoirs in 2014-2019 based on monitoring," Chief Inspectorate Of Environmental Protection 2019.



[95] Analysis of the availability of nursery care for children under 3 years of age in the Lodzkie Region. Study commissioned by the Regional Operational Program of the Lodzkie Region for 2014-2020. Łódź, April 2017.
[96] http://es.rcpslodz.pl/
[97] Assessment of the status of water bodies of rivers and dam reservoirs in 2014-2019 on the basis of monitoring, Chief Inspectorate of Environmental Protection 2019. For the remaining 4.7% of water bodies, it was impossible to conduct the above assessment.
[98] According to the Water Management Plans for the Vistula and Oder basins (Regulations of the Council of Ministers dated 18 October 2016, items 1911, 1967), the achievement of environmental objectives for surface water bodies (achieving desirable ecological status/potential and chemical status) and groundwater bodies (achieving desirable chemical status and good quantitative status) should occur in the shortest possible time. However, due to the occurrence of significant anthropogenic impact, the adopted environmental objectives may not be achieved, therefore the deadline for their achievement was extended until 2021 or 2027.

In spite of the ongoing construction and modernisation of sewage treatment plants, communal and industrial wastewater from point sources continues to be the main source of surface water pollution, along with pollution from focal and diffuse sources (rinsed off by precipitation from urbanised and agricultural areas, or generated by the population that does not use the combined sewer system and through atmospheric deposition),[99] as well as from linear (transport-related) sources.

Currently, the most important environmental problem in the Lodzkie Region is the **eutrophication of surface waters**. Due to limited self-purification capacity, water reservoirs with high concentrations of nutrients and unfavorable oxygen conditions are particularly susceptible to this phenomenon. The water status for the three reservoirs surveyed in 2019 (Sulejowski, Jeziorsko and Wąglanka-Miedzna) was assessed as poor. The weakest ecological potential is that of the Sulejów Reservoir,[100] where eutrophication has contributed to a significant degradation of its natural and touristic values (including blue-green algae bloom). In addition, 121 surface water bodies in the Lodzkie Region have been identified as pollution-sensitive as a result of nitrogen compounds from agricultural sources, responsible for a high level of eutrophication.[101]

Climate change

Challenge: High risk of drought and other extreme weather and climate phenomena

Climate change and associated extreme weather phenomena (increasingly high air temperatures, strong insolation, precipitation deficit, extreme droughts) generate the occurrence of soil water deficits, along with the reduction of surface-, ground-, and underground water resources. A significant part of the Lodzkie Region is characterized by high water deficits during the growing season, and the phenomenon of drought is the most important problem projected to affect the areas of intensive agriculture.[102]

Fig. 33. Water deficit in 2019.
Source: own study based on the IUNG Agricultural Drought Monitoring System, PPSS, KWB Bełchatów

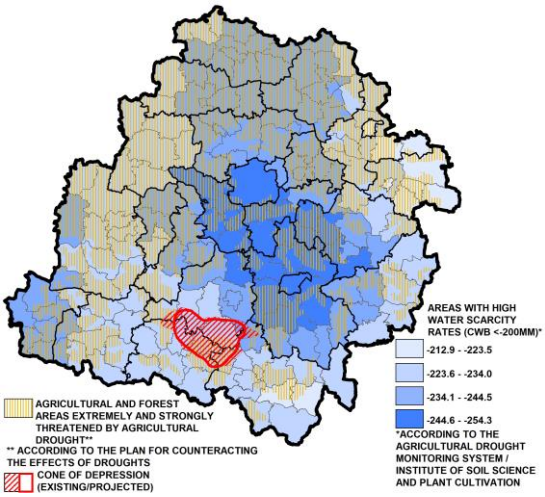
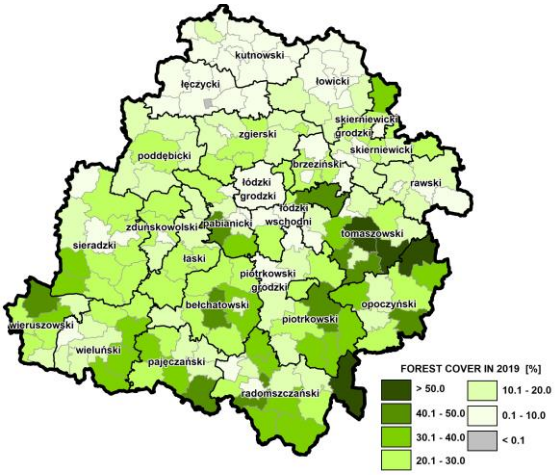


Fig. 34. Forest cover in the region in 2019.
Source: own study based on Statistics Poland data



[99] According to the River Basin Management Plans for the river basin districts of the Vistula and Oder basins (Regulations of the Council of Ministers dated 18 October 2016, items 1911, 1967). Atmospheric deposition is a source of surface water pollution by multi-molecular aromatic hydrocarbons (PAHs) from low emissions.

[100] Assessment of the status of water bodies of rivers and dam reservoirs in 2014-2019 based on monitoring, GIOŚ 2019.

[101] The surface water bodies (water bodies) sensitive to pollution by nitrogen compounds from agricultural sources in the water regions of the Warta River and the Middle Vistula River in the area of the Lodzkie Region were listed on the basis of:
- Regulation of the Director of the Regional Water Management Board in Poznań dated 28 February 2017 on the determination of surface waters and groundwater in the Warta water region as sensitive to pollution by nitrogen compounds from agricultural sources and the vulnerable area from which the outflow of nitrogen from agricultural sources to these waters should be limited (Official Gazette of the Lodzkie Region dated 1 March 2017, item 1077),
- Regulation of the Director of the Regional Water Management Board in Warsaw dated 29 March 2017 on the determination of surface- and groundwater sensitive to pollution by nitrogen compounds from agricultural sources and the particularly vulnerable area, from which the outflow of nitrogen from agricultural sources to these waters should be limited within the boundaries of the Middle Vistula, Łyna and Węgorapa, Neman, Świeża and Jarft water regions (Official Gazette of the Lodzkie Region dated 31 March 2017, item 1668).

[102] According to the reports of the Agricultural Drought Monitoring System in Poland http://www.susza.iung.pulawy.pl/tabele/10/ for the period between 1 June 2019 and 31 July 2019, the most acute water deficit in the Lodzkie Region was registered in the commune of Moszczenica (at the time when the Climatic Water Balance – CWB reached the value of -254.3 mm).

Fig. 35. Share of green space[103] in urban areas in 2019
Source: Own study based on Statistics Poland data

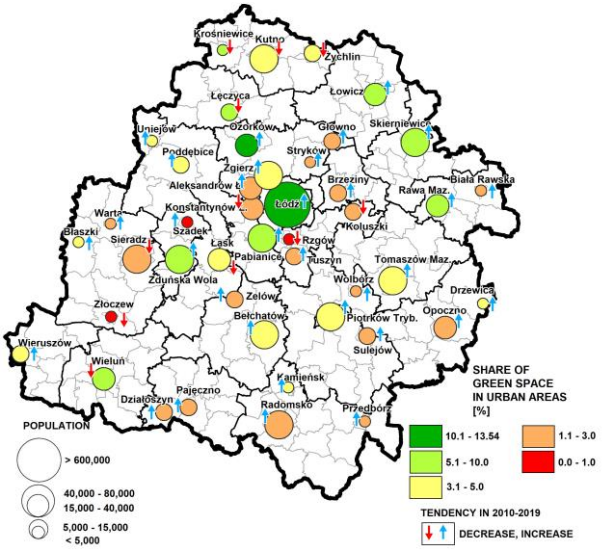
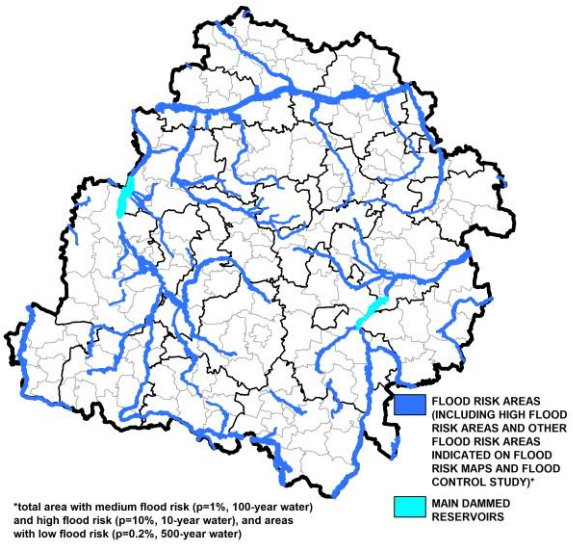


Fig. 36. Flood risk
Source: own study based on State Water Holding Wody Polskie data

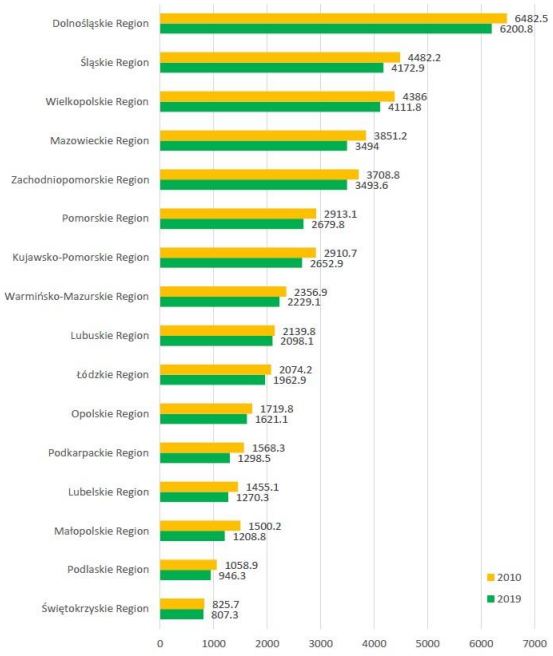


Based on the data from the multiannual period of 1971-2000, the mean annual temperature in the Lodzkie Region increased by 2 to 3°C, especially in its northern and western parts. Anomalies in annual precipitation were also recorded, with a 10-30% decline in rainfall, resulting in the occurrence of **a low precipitation zone (below 400 mm per year)** stretching in the north-western and western parts of the region. An additional factor contributing to drought is **the lowest rate of the forest cover in Poland** and **a very low retention capacity of the catchment area**. Moreover, the problem of water shortage is noticeable in the area of **the cone of depression** caused by **the activity of the Bełchatów Lignite Mine**.[105]

Urban centers, especially the largest ones, are struggling **to adapt to climate change** due to extreme weather phenomena such as heat waves, heavy rains and sudden/urban flooding. High intensity rainfall of short duration in limited catchment areas[106] with impeded water infiltration and often obstructed drainage systems results in flooding. The greatest accumulation of problems associated with extreme phenomena occurs in cities with populations over 100,000. In Łódź, 3 out of 10 major climate hazards have been identified, i.e. heat waves, intense rainfall and storms, and urban floods.[107] Extreme climatic phenomena also occur in rural areas, where strong winds cause damage to buildings and overhead infrastructure.

Extreme weather phenomena are conducive to floods. Flood hazards were identified in the region;[108]

Fig. 37. Total area of family allotment gardens [104] by region in 2019 [expressed in ha].
Source: own study based on Statistics Poland data



[103] Including parks, greens, residential green areas, street greenery, cemeteries and communal forests.
[104] Before the nomenclature change, they were known as "employee allotment gardens."
[105] The utilisation rate of groundwater disposable resources is very high, with withdrawal values far exceeding the amount of resources available for development. Draft Plan for Counteracting the Effects of Drought (dated 19 January 2021). State Water Holding Wody Polskie.
[106] Oder River Basin Management Plan (Regulation of the Council of Ministers dated 18 October 2016, item 1967.).
[107] "Climate change adaptation plans for 44 Polish cities: a summary publication," Warsaw 2018 (www.44mpa.pl).
[108] Flood hazard areas including areas of heightened flood hazard and other areas as indicated on flood hazard maps and in flood protection studies; areas where the probability of flooding is high (p=10%, 10-year water), medium (p=1%, 100-year water) and low (p=0.2%, 500-year water). On

the level of integrated flood risk in the water regions of the Warta and the Middle Vistula was determined as moderate, and the region was identified as an area with increased water needs (together with the Wielkopolskie and Opolskie regions).[109]

One of the important elements conducive to adaptation of cities to climate change are green areas and other green spaces, which create a system of blue-green infrastructure. As of 2019, the average share of green areas in the cities of the Lodzkie Region amounted to 5.97% (with the Polish average sitting at 4.77%), as a slight increase was recorded in this respect.[110] The opposite trend can be seen in the total area of family allotment gardens in the region, which decreased by 111.3 ha between 2010 and 2019.

Air quality

Challenge: Very poor air quality, in particular in urban areas

Poor and largely unsatisfactory air quality, linked with surface, linear, and point source emissions, is an acute problem in the Lodzkie Region, especially in its largest cities.

Surface emissions (also known as low emissions) connected with burning solid fuels in household furnaces result in exceeding the admissible level of benzo(a)pyrene in the PM10 particulate matter, as well as the permissible daily value of PM10 particulate matter, the permissible average annual value of PM2.5 particulate matter, the long-term objective level of ozone concentration, and the formation of smog, which contributes to poor health of the region's residents. In terms of exceedances, the cities of the Lodzkie Region are among the leaders in the country. The problem concerns not only the Łódź agglomeration, but also other urban centers (including Brzeziny, Piotrków Trybunalski, Opoczno, Radomsko, Tomaszów Mazowiecki, Zduńska Wola).[111]

In 2019, exceedances of the permissible value of the average daily concentration of PM10 were recorded in 12 centers (Łódź, Brzeziny, Łowicz, Opoczno, Pabianice, Piotrków Trybunalski, Radomsko, Rawa Mazowiecka, Sieradz, Tomaszów Mazowiecki, Zduńska Wola, Zgierz), with the highest levels observed in Radomsko. Four cities in the region were in the group of 21 centers in Poland with at least 60 days with PM10 concentration over 50 µg/m3.[112] The longest period with high pollution levels was observed in Zgierz (60 days), Piotrków Trybunalski (60 days), Radomsko (64 days) and Zduńska Wola (61 days). The target level of benzo(a)pyrene in PM10 dust reached values above the standard at 17 measurement stations, including those in Łódź, Bełchatów, Brzeziny, Kutno, Łowicz, Opoczno, Pabianice, Piotrków Trybunalski, Radomsko, Rawa Mazowiecka, Sieradz, Skierniewice, Tomaszów Mazowiecki, Uniejów, Wieluń and Zduńska Wola. Excessive levels of concentration of PM2.5 particulate matter was recorded in the Łódź metropolitan area. However, it should be noted that in the majority of cities where no exceedances were recorded in 2019, measurement stations nonetheless showed high values of concentration.[113] The problem of poor air quality also concerns rural areas, where the main source of heat is individual heating installations fired with solid fuels.

Another determinant of poor air quality is the level of **linear emissions** from road transport. High traffic intensity contributes to increased concentrations of nitrogen oxides, carbon oxides and heavy metals. As a result, ozone concentrations increase at high temperatures. The highest concentration of these emissions is observed in the vicinity of the A1 and A2 motorways, S8 expressway, within the dense road network in the Łódź agglomeration, and along national roads with increased vehicle traffic, including transit traffic in areas with dense residential development.

the basis of the flood hazard map it has been determined that the Lodzkie Region is partly located in an area susceptible to flooding in the event of damage to or destruction of levees.

[109] Flood risk management plans for the Oder and Vistula river basins (Regulations of the Council of Ministers dated 18 October 2016, items 1938, 1841).

[110] In 2010, this rate sat at 5.52%.

[111] Annual assessment of air quality in the Lodzkie Region - regional report for 2019, Chief Inspectorate of Environmental Protection, Regional Department of Environmental Monitoring in Łódź, Łódź 2020.

[112] http://powietrze.gios.gov.pl

[113] Annual assessment of air quality in the Lodzkie Region - regional report for 2019, Chief Inspectorate of Environmental Protection, Regional Department of Environmental Monitoring in Łódź, Łódź 2020.

Fig. 38. Emissions of gaseous pollutants from particularly onerous establishments by region in 2010 and 2019 [thousand t/year].
Source: Own study based on Statistics Poland data

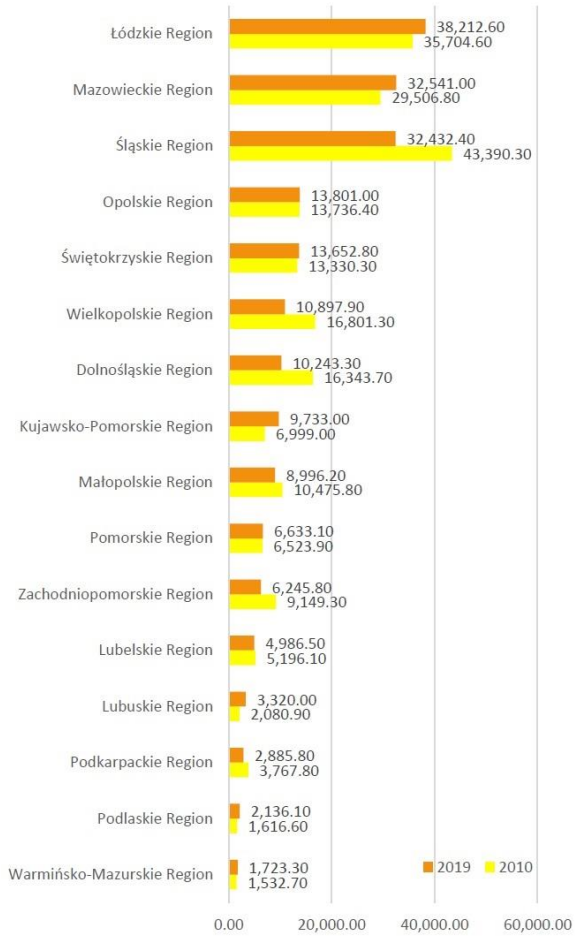
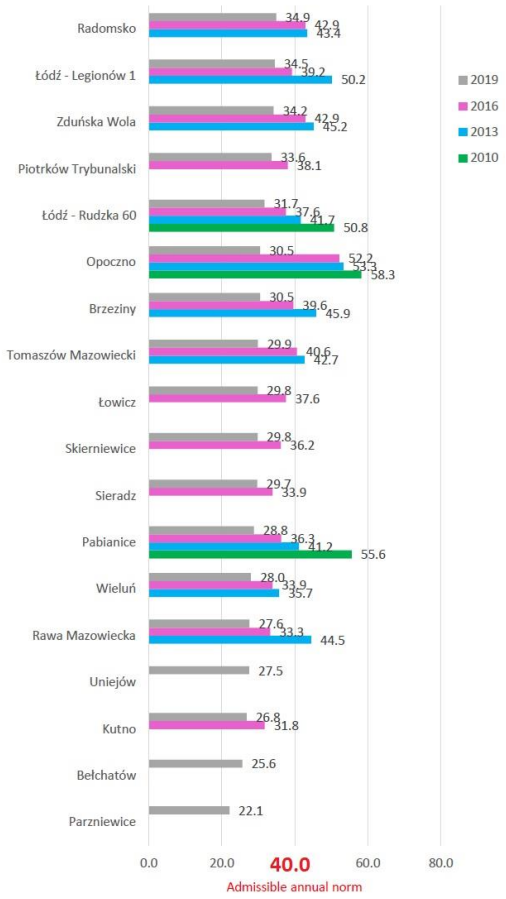


Fig. 39. Average annual values of PM10 concentrations in the Lodzkie Region recorded at measurement stations in the years 2010-2019
Source: own study based on Chief Inspectorate of Environmental Protection data available at: http://www.gios.gov.pl



In terms of **point emissions** in 2019, the Lodzkie Region was among the regions with the highest emission rates: sulfur dioxide (36.2 thousand tons, ranked 1st in the country), nitrogen oxides (30.8 thousand tons, 1st in the country), dust (1.93 thousand tons, 4th in the country), carbon oxides (28.4 thousand tons, 3rd in the country), carbon dioxide (38,115.7 thousand tons, ranked 1st). Emitters contributing to this level of emissions mainly include particularly onerous establishments, which in 2019 emitted a total of 38,212.6 thousand tons of gaseous pollutants (1st in the country), 99.7% of which were carbon dioxide emissions. Compared to 2010, carbon dioxide emissions increased by 7.2 p.p., while the levels of other gaseous and particulate pollutants decreased.[114] It should be noted that considerable point emissions in the Lodzkie Region are mainly tied to the energy sector.

Contributing to poor air quality is the slow pace of implementation of the anti-smog resolution and air protection programs,[115] insufficient monitoring of pollution, and low ecological awareness of residents. Many buildings still need to be re-insulated, and a number of district heating networks are insufficiently developed. In terms of transport infrastructure, many localities are still host to intensive transit and local car traffic in densely developed areas, and transport itself requires investments in order to reduce the current emission levels. The existing bicycle routes do not form a coherent and collision-free network. Another problem with respect to the ventilation of urbanised areas is the need to develop aeration corridors.

[114] As per the Statistics Poland Environmental Protection 2020 data. According to the Report on the State of the Environment in the Lodzkie Region in 2017, conducted by the Regional Inspectorate of Environmental Protection, the largest emitters of gases and dust in the Lodzkie Region are Bełchatów Power Plant, Łódź Combined Heat and Power Plants, along with the power plants producing heat for other cities of the region (in Zgierz, Piotrków Trybunalski, Pabianice, Sieradz, Zduńska Wola, Skierniewice, Wieluń and Radomsko), followed by EUROGLAS POLSKA sp, Os. Niewiadów gm. Ujazd, PFLEIDERER PROSPAN S.A., Wieruszów, Cementownia "WARTA" S.A., OPOCZNO I sp. z o.o. in Opoczno.

[115] For the areas where exceedances of permissible pollutant concentrations were recorded.

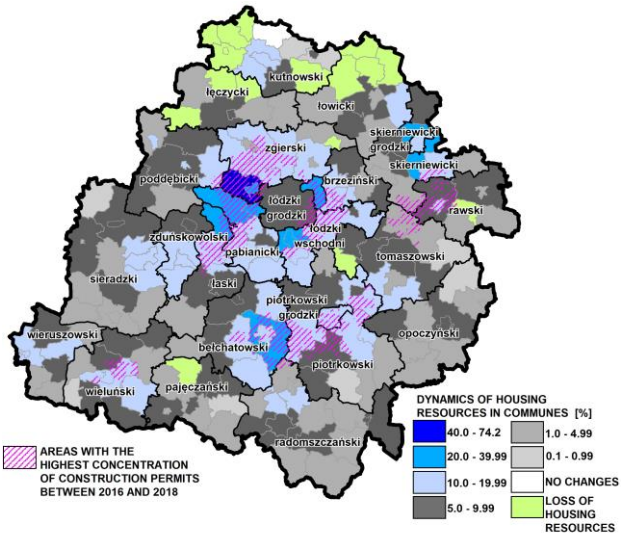
Urbanisation

Challenge: Intensifying urbanisation pressure

The **intensifying urbanisation pressure** observed in recent years, both in the Lodzkie Region and in the entire country, is clearly noticeable space-wise. It results, among others, from the **migration of the urban population to rural areas and the development of investment areas.** It is driven by such phenomena as uncontrolled suburbanisation, encroachment of buildings into areas of high natural and scenic value (e.g. river valleys), and the development of infrastructural, industrial, and advertising facilities.

The area of built-up and urbanised land in 2019 amounted to 111,002 ha (6.1% of the region's area) and increased by 17,690 ha compared to 2010. Urbanisation pressure is evidenced, among others, by the number of building permits issued, the increase in housing stock, and the increase in the population of suburban communes.

Fig. 40. Dynamics of housing resources in communes in 2010-2019
Source: Own study based on Statistics Poland data



The spatial policy pursued by local governments results in the dispersion of development and lack of spatial order. All communes, especially the rural ones, regardless of the existing and projected demographic situation and depopulation processes, project an increase in the area of land designated for residential functions. In 2010-2018, the area earmarked for residential areas in the studies of the conditions and directions of spatial management plans of the Lodzkie Region communes increased by 15,458 hectares, and the overestimation of future residential areas (9.2 times in relation to the existing ones) significantly exceeds the actual and projected needs of the population of communes. In 2018, the total demographic capacity[116] of the designated residential areas in the region amounted to 9,061,560 people and was 3.67 times higher than the region's population (which consisted of 2,466,322 residents as of 2018).[117]

New **development has been spreading in an uncontrolled manner**, in the absence of local spatial management plans, according to the rules defined in individual decisions on development conditions. This results in the dispersion of development and creation of housing estates lacking in adequate infrastructure and access to basic services. Another unfavorable phenomenon is the encroachment of buildings on valuable natural and scenic areas, including river valleys and floodplains, which results in environmental degradation and disturbs the balance between undeveloped and developed areas. As a result, the quality of life plummets, operating costs increase, and so does the pressure on the natural environment, including air pollution.

Economic development is clearly manifested in the physiognomy of the landscape. While facilities connected with infrastructural and industrial investments are necessary, they are built without prior analyses of their spatial impact, which contributes to the overloading of landscapes with elements of technical infrastructure and advertisements, and as a result in disharmony caused by facilities that tower over respective areas or dominate them volume-wise. This, in turn, results not only in the degradation of valuable cultural and natural landscapes but also in disturbance of expositional values of areas aesthetically valuable areas (e.g. monuments, skylines of historic settlements).

[116] The value of demographic capacity was adopted in accordance with the assumptions proposed in the Report on the Economic Losses and Social Costs of Uncontrolled Urbanisation in Poland, compiled by the Polish Academy of Sciences, adopting a basic level of housing intensity of 40 persons/1 ha for single-family residential areas, and 200 persons for multifamily residential areas).

[117] Annual report on the monitoring of spatial planning processes at the local level in the Lodzkie Region for 2019, Spatial Planning Office of the Lodzkie Region.

Cultural heritage

Challenge: Degradation of functional and spatial systems and structures in historic settlement units

The preserved cultural heritage of the region is characterized by diversity, resulting primarily from multicultural historical traditions. Its most complete picture is presented by the regional register of immovable heritage (WEZ), which, as of 2019, comprises 6,777 items,[118] 38% of which are listed buildings and areas (2,551). In quantitative terms, this places the Lodzkie Region in the 14th position in the country.[119]

Concentrations of the highest historic values occur in historic settlement units. However, out of about 100 settlement units with confirmed urban origins, only 47 are included in the WEZ, and only 16 are listed (in whole or in part) in the register of historic monuments. The specific features of the preserved historical spatial systems create a unique character of the cultural landscape that includes 66 units forming a network of historic settlement units.[120]

Fig. 41. Revitalisation processes in historic centers against the background of monuments of highest cultural value
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

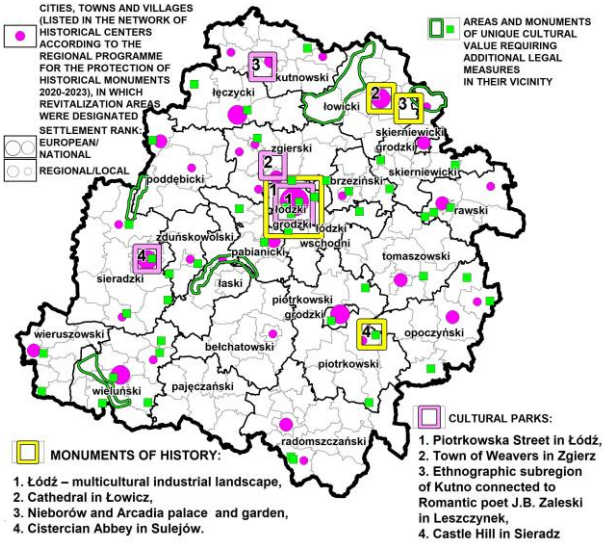
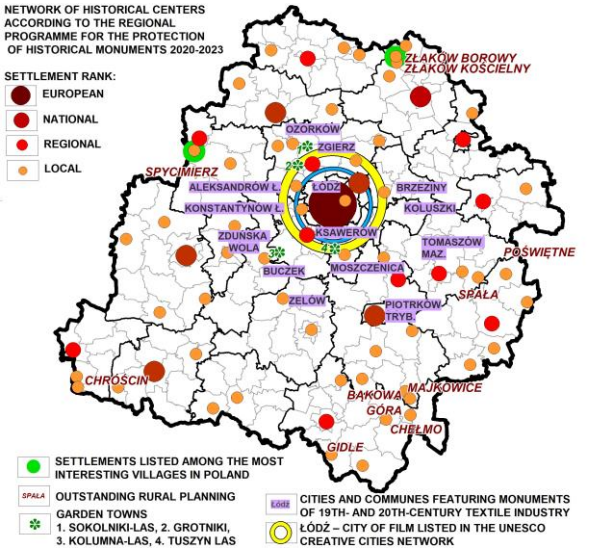


Fig. 42. Specific components of cultural heritage
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region



The highest concentration of urban values can be encountered in medieval units, especially Łęczyca, Sieradz, Rawa Mazowiecka,[121] as well as Piotrków Trybunalski, Łowicz, and Wieluń. The region is also characterized by multicultural and industrial localities with their own specific traditions, mostly linked to the development of the 19th-century textile industry; these include, above all, Łódź with its metropolitan landscape, and the towns in its vicinity (e.g. Aleksandrów Łódzki, Konstantynów Łódzki, Ozorków, Pabianice, Tomaszów Mazowiecki, Zelów and Zgierz).

This regional specificity is reflected by areas and objects of outstanding scenic value,[122] including the 4 most valuable monuments of history, located in Łódź, Łowicz, Nieborów-Arkadia, and Sulejów-Podklasztorze (in this

[118] According to the Regional Monuments Protection Authority in Łódź (as per 31 December 2019).
[119] Report on the state of preservation of immovable monuments in Poland. Monuments entered in the register of monuments (register books A and C), National Heritage Institute, Warsaw 2017.
[120] The Regional Program for the Care of Monuments in the Lodzkie Region for 2020-2023 identifies 1 center of European rank: Łódź; 5 centers of national importance: Łęczyca, Łowicz, Piotrków Trybunalski, Sieradz, Wieluń; 11 centers of regional importance: Kutno, Opoczno, Pabianice, Radomsko, Rawa Mazowiecka, Skierniewice, Tomaszów Mazowiecki, Uniejów, Wieruszów, Wolbórz, Zgierz; and 49 centers of local stature.
[121] Capital cities of the most important historical lands, which constitute the core of the region as currently constituted, whose emblems have been incorporated into the coat of arms of the modern-day Lodzkie Region.
[122] The Spatial Management Plan of the Lodzkie Region indicates sites and areas of the highest cultural value that require extensive legal protection (including the spatial layout of the Nowosolna housing estate, whose values have been questioned with the intention of excluding the estate from the register of historic monuments), which are also included in the extended catalogue of recommendations included in the Regional Program for the Care of Monuments for 2020-2023.

respect, the region ranks 13th in the country),[123] and 4 cultural parks (3rd in Poland)[124] in Leszczynek, Łódź, Sieradz, and Zgierz.

In spite of reformative ventures undertaken in the historical settlement units, there are still **numerous problems with the protection of the preserved heritage**. In the process of spatial development, the historic structures with preserved historic layouts are exposed to a number of adverse factors that result in the **gradual disappearance of their specific features** (including those that are evidence of historic presence of **national minorities** in the area as well as religious minorities), mainly due to chaotically sprawling urban development and lack of harmony in the planning processes, causing disharmony in the structure of historical localities and resulting in the gradual **disappearance of local architectural forms** and **traditional forms of development**, which ultimately leads to the **impoverishment of the cultural landscape**. These negative phenomena exert a particularly strong influence on the few preserved valuable **rural layouts**,[125] where the traditional **rural architecture** (with its specific features, especially in the Łowicz and Opoczno areas) is gradually disappearing.

Threats to the preservation of skylines have been diagnosed in most of the historic centers, especially with respect to cultural heritage and landscape physiognomy.[126] The spatial and visual chaos is exacerbated by the introduction of new high-rise and large-size dominants and the presence of numerous and/or large-size advertisements.

The rapid disappearance of industrial functions as a result of the economic transformation has also contributed to the **negative transformation of the cultural landscape**. As a result, degraded historical post-industrial structures see a high concentration of spatial and social problems.

One serious shortcoming is the still **insufficient effectiveness of protection**, especially with respect to the most valuable forms of cultural heritage. It is caused by the insufficient use of available tools (e.g. local spatial management plans and advertising resolutions), incomplete synchronisation of institutional cooperation, and lack of an integrated information system, as well as insufficient social awareness of the importance of preserving the values of cultural landscapes.

A positive phenomenon with respect to the improvement of the condition of spatial structures is the implementation of **revitalisation measures** in many centers; with respect to post-industrial heritage, these measures are pursued on a large scale mainly in Łódź, but also in Pabianice and Zgierz, among other locations. Nevertheless, the scale of degraded objects and areas in need of revitalisation is still significant.

The preserved cultural heritage fits the Lodzkie Region in the system of European Cultural Routes (Amber Rout, Cistercian Route, Romanesque Route, St. James's Route, and the Warsaw-Vienna Railway Route) and, together with its post-industrial and film traditions, provides the basis for the development of cultural, educational, and festival tourism.

Natural assets

Challenge: Insufficient protection and sustainable use of natural assets, including biodiversity

The Lodzkie Region is characterized by a relatively small ratio of **legally protected areas.** [127] In 2019, their share amounted to 19.5% of the entire territory of the region (15th in the country; Polish average: 32.3%) and decreased by 0.1 percentage points compared to 2010. There were 1,450 m2 of legally protected areas of special natural interest per capita (14th in the country; Polish average: 2,633 m2).[128]

[123] Data for 2020, www.prezydent.pl

[124] Ex aequo with the Małopolskie, Mazowieckie, Śląskie, and Pomorskie regions. As per own study of Spatial Planning Office of the Lodzkie Region, based on the National Institute of Cultural Heritage – Register of Cultural Parks in Poland (29 November 20199); and Myczkowski Z., Marcinek R., Siwek A., "The Cultural Park as a form of cultural landscape protection," OT NID Kraków, 2017.

[125] Identification of rural layouts with significant landscape and cultural values across the Lodzkie Region and their valorisation in terms of recommendations on the designation of priority landscapes, Wójcik M., Dmochowska-Dudek K., Łódź, December 2018.

[126] Diagnosis of scenic and compositional values and threats to the possibility of their preservation in the Lodzkie Region; Pracownia Projektowa URBIOSIS Agnieszka Kowalewska, December 2018.

[127] Pursuant to the Nature Protection Act dated 16 April 2004 (Journal of Laws of 2020, items 55, 471, 1378).

[128] Environmental protection 2020, Statistics Poland, Warsaw 2020.

Fig. 43. Share of protected areas by region in 2010-2019. [%]
Source: Own study based on Statistics Poland data

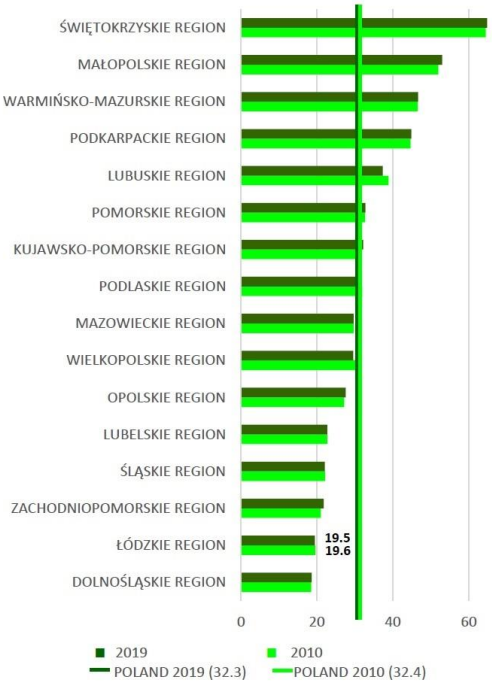
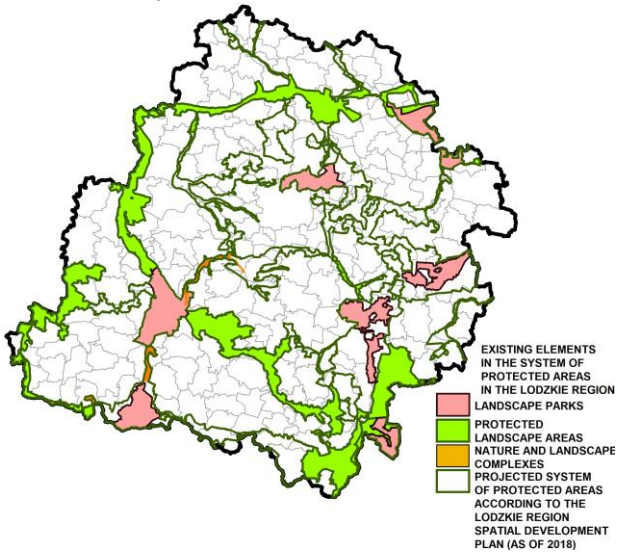


Fig. 44. Existing elements of the system of protected areas in the Lodzkie Region in 2019.
Source: own study based on BDOT, CRFOP data



Natura 2000 sites constitute a separate system of nature conservation, whose main objectives are to preserve certain types of natural habitats and species considered valuable and endangered throughout Europe, and to protect its biodiversity. In 2019, the Lodzkie Region had a total of 41 Natura 2000 sites (5 Special Bird Protection Areas, 7 Special Habitat Protection Areas, 29 Sites of Community Importance), occupying 5.8% of its area.

Problems in increasing the share of legally protected areas include: insufficiently regulated legal status, reluctance of local authorities to establish new forms of nature protection,[129] lack of protection plans for some landscape parks,[130] and lack of comprehensive landscape monitoring. This leads to the **incoherence of the system of protected areas** and weak natural connections on a regional and supraregional scale. Threats to the preservation of biodiversity include: invasions of alien plant and animal species, declining groundwater levels, especially in hydrogenic habitats, secondary succession in non-forest ecosystems, declines in tree health as a result of climate change, as well as the lowest forest cover rate in the country, coupled with the domination of pine monocultures, investment pressures with respect to valuable areas, environmental pollution, and low environmental awareness of the public.

Some of the areas of high natural and scenic value have been placed under legal protection and used for the purposes of shaping the regional system of protected areas.[131] As of 2019, its existing elements accounted for just over 16.0% of the total area of the region, with the eventual value projected at about 29.0%.

The natural assets of the Lodzkie Region, including its thermal and therapeutic waters, show a great yet partly untapped potential with respect to the development of sports, tourism and recreation, as well as balneology sectors.[132]

[129] In the years 2010-2020, the Regional Assembly of the Lodzkie Region adopted 9 resolutions clarifying the legal status of the existing protected landscape areas (Brąszewicki, Przedborski, Wolbórka Valley, Nadwarciański, Chojnatka Valley, Piliczański, Widawka Valley, Berlin-Warsaw Proglacial Stream Valley, Prosna Valley).

[130] No protection plans have been drafted so far for the Załęczański an Spalski Landscape Parks.

[131] The System of Protected Areas (SOCh) proposed under the Spatial Management Plan of the Lodzkie Region includes: 7 existing landscape parks, 26 protected landscape areas (including: 9 existing, 7 to be verified, and 10 new protected landscape areas), 3 existing natural and landscape complexes. The existing Miazga Valley Protected Landscape Area near Andrespol is not included in the proposed system of protected areas in the Lodzkie Region.

[132] Potential for the development of health tourism, including spa and rehabilitation tourism, may be provided by the geothermal water resources in Kleszczów, Łódź, Poddębice, Rogóźno, Sieradz, Skierniewice, Uniejów.

Road transport

Challenge: Incomplete road accessibility of the region

The Lodzkie Region is relatively well-equipped in **public roads.**[133] In 2019 their length was 26,034.2 km (7th in the country), and their density was 142.9 km/100 km2 (7th in the country) (Poland 135.9 km/100 km2).

Fig. 45. Road layout in the Lodzkie Region
Source: own study based on data from the Spatial Planning Office of the Lodzkie Region

Many national roads cross the territory of the region, including two intersecting corridors of the basic Trans-European Transport Network[134] (TEN-T)[135] and other important elements of this network, both its core (A1, A2, S8 Wrocław - Łódź) and comprehensive (S8 Piotrków Trybunalski - Warsaw, S12, S74) road sections. The length of national roads has increased by 137.1 km since 2010 and amounted to 1,485.9 km in 2019 (3rd in the country). In the same period, the length of motorways increased from 77.2 km to 226.2 km (1st in the country), while the length of expressways increased to 223 km (5th in the country). In 2019, the density of national roads was 8.2 km/100 km2 (3rd in the country), including motorways and expressways of 2.5 km/100 km2 (2nd in the country; national average: 1.3 km/100 km2).

The total length of **regional roads** in the Lodzkie Region increased from 1,178.6 km in 2010 to 1,363.4 km (14th in Poland) in 2019. With a density of regional roads amounting to 7.5 km/100 km2, the region was ranked 15th in the country (Polish average: 9.4 km/100 km2), which was compensated by the high density of national roads.

The Lodzkie Region is characterized by a relatively well-developed network of **district and communal roads**, whose total length in 2019 amounted to 23,184.9 km (7th in the country), of which 18,160.0 km (6th in the country) were hard-surfaced roads. The density of hard-surfaced district and communal roads in the region in 2019 amounted to 99.7 km/100 km2 (4th in the country), higher than the national average of 82.6 km/100 km2.

[133] National, regional, district and communal.
[134] Baltic Sea - Adriatic Sea and North Sea - Baltic Sea.
[135] TEN-T (Trans-European Networks - Transport) - Trans-European transport network, consisting of a comprehensive and core network. The comprehensive network consists of all existing and planned elements of the TEN-T transport infrastructure and measures supporting its efficient and sustainable use, serving among others to increase accessibility of all EU regions, integrate different transport modes and increase their interoperability, complete missing links and eliminate bottlenecks, and increase safety. The core network consists of selected parts of the comprehensive network which are of the highest strategic importance for achieving the objectives of the network.

The incomplete strategic system of motorways and expressways is a significant problem for the Lodzkie Region. Despite a dynamic growth of expressways in the region in recent years, the road network still needs to be completed in the south-eastern part of the region (S12, S74, and the A1 - S8 link); the A2 section between Łódź and Warsaw requires a redevelopment to increase its capacity in the context of the construction of the Solidarity Transport Hub and to tighten the bipolar system of the metropolitan areas of Warsaw and Łódź; the ongoing construction works along the A1 Tuszyn - Częstochowa motorway and the Łódź Western Ring Road (S14) need to be completed, too. Additionally important in the context of making a fuller use of the motorways and expressways is the shortage of high-quality access to interchange points, particularly in the area of Łódź, where the access road system needs to be supplemented and the existing connections with interchanges extended and adjusted to the projected traffic volume.

Fig. 46. Condition of road surfaces in the Lodzkie Region in 2020
Source: Own study based on data from the Road Authority of the Lodzkie Region

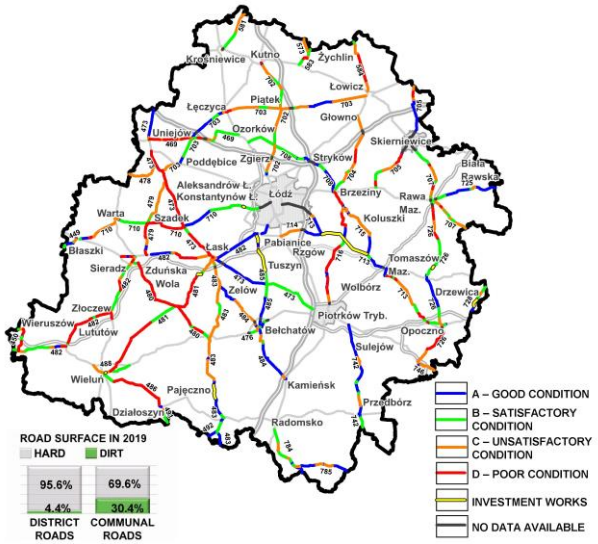
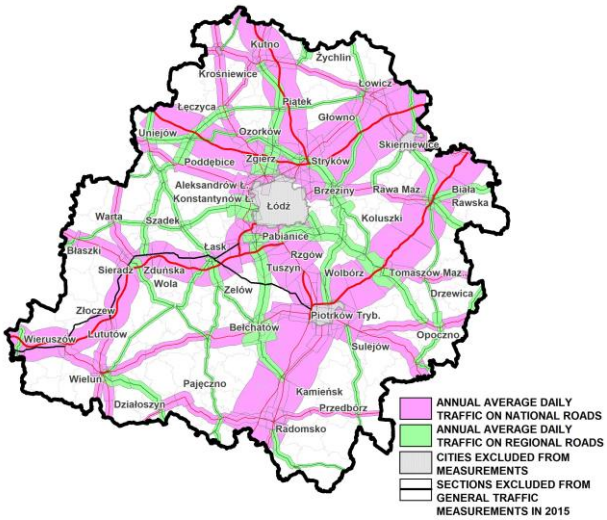


Fig. 47. Annual average daily traffic in the Lodzkie Region in 2015.
Source: own study based on the 2015 General Traffic Measurement (GPR)



Despite increasing spending on the modernisation of the road network in the recent years, the region continues to struggle with the **insufficient standard of national, regional , district and communal roads (including bridges and railway viaducts).** Technical reviews show that 28.6% of national roads[136] and 45.1% of regional roads[137] were in a bad and unsatisfactory condition, and required modernisation. The high share of communal and district roads with dirt surfaces in the total length of these roads, which amounted to 21.7% in 2019 (8.3 p.p. less than in 2010), is also a problem.

The **lack of bypasses is a serious problem, especially in light of the high level of congestion and transit traffic intensity.** In 2015, the average daily traffic[138] on national roads in the region was 13,415 vehicles/day (3rd in the country), which was higher than the national average (11,178 vehicles/day). The increase in traffic compared to 2010 was the highest in the country (by 26.0% against the Polish average of 14.0%). The average daily vehicle traffic on regional roads in 2015 was 4,252 vehicles/day (3rd in the country; national average: 3,520 vehicles/day). According to the results of the 2015 General Traffic Measurement, the localities whose centers are host to the heaviest traffic, including a significant share of trucks, were the following:

- National roads: Radomsko (DK91/42), Aleksandrów Łódzki (DK72), Wieluń (DK45/43), Błaszki (DK12), Brzeziny (DK72), Srock (DK91), Łowicz (DK70) and Poddębice (DK72), Sulejów (DK12/DK74);

[136] Based on the Report on the technical condition of the surface of the national road network at the end of 2019, General Directorate for National Roads and Motorways, Warsaw 2020.
[137] Based on the annual review conducted in the second quarter of 2020 on the regional road network managed by Road Authority of the Lodzkie Region.
[138] The General Traffic Measurement is conducted in 5-year intervals on the existing network of national and regional roads with the exclusion of sections managed by the mayors of cities with district rights (Łódź, Piotrków Trybunalski, Skierniewice). The most recent general traffic measurement was published in 2015. Due to the COVID-19 pandemic in 2020, some of the planned traffic measurements within the General Traffic Measurement 2020 were postponed until 2021. Its results will be published in the fourth quarter of 2021.

- Regional roads: Bełchatów (DW484), Łęczyca (DW703), Szadek (DW710), Biała Rawska (DW725), Tomaszów Mazowiecki (DW713), Konstantynów Łódzki (DW710), Koluszki (DW716/715), Brzeziny (DW715/708) and Zgierz (DW702).

Within the framework of the Government Program for the Construction of 100 bypasses, adopted in 2021, the Lodzkie Region will see the construction of 5 bypasses by 2030, which will be built around the towns of Błaszki (DK12), Brzeziny (DK72), Łowicz (DK14/70/92), Srock (DK91) and Wieluń (DK45). In addition, the bypasses of Aleksandrów Łódzki (DK72), Skierniewice (DK70) and Stryków (DK14) have been put on the reserve list.

Heavy road traffic poses a threat to **traffic safety and air quality**. Despite a decrease (since 2010) in the number of road accidents and fatalities by 806 and 81, respectively, the Lodzkie Region still saw a high number of road accidents and fatalities in 2019, sitting at 3,351 (2nd in the country) and 239 (3rd in the country), respectively. Also contributing to the decline in road safety is the rising **motorisation rate**, which has increased by 194.8 vehicles/1,000 inhabitants since 2010 to reach 643.2 in 2019 (6th in the country) against the national average of 634.7.

Rail transport

Challenge: Lack of inclusion in the high-speed rail system

The region has a favorable transport location at the junction of **two corridors of the basic trans-European transport network (TEN-T),** which includes the existing and planned railway lines of the core network, i.e. passenger lines (E65/CE65 line [139] and high-speed Warsaw - Łódź - Poznań/Wrocław lines) along with those intended mainly for freight traffic (CE65, E20/CE20, CE20 and C65/1).[140] The core network is supplemented by railway line no. 25 between Łódź and the border with the Świętokrzyskie Region, which is part of the comprehensive network.

Fig. 48. Railway system in the Lodzkie Region.
Source: own study based on the Spatial Planning Office of the Lodzkie Region

In spite of the above infrastructure, the Lodzkie Region is characterized by a relatively underdeveloped rail network. The **railway lines density ratio** in 2019 was 5.9 km/100 km2 (national average: 6.2 km/100 km2), which results in limited access to the railway network for many cities. Of the 46 cities in the region, as many as 17 have no access to railway lines,[141] and another 4 are located along railway lines with no passenger services.[142,143] In 2019, the total length of railway

[139] E65/CE65 Gdynia – Warsaw – Central Railway Line – Katowice – Zebrzydowice.
[140] CE65 Gdynia – Tczew – Zduńska Wola Karsznice – Chorzów Batory – Zwardoń, E20/CE20 Kunowice – Poznań – Kutno – Warsaw – Terespol, CE20 Kunowice – Poznań – Kutno – Pilawa – Terespol, C65/1 Zduńska Wola Karsznice – Łódź – Skierniewice (connector between CE65 & CE20).
[141] Aleksandrów Łódzki, Biała Rawska, Brzeziny, Konstantynów Łódzki, Krośniewice, Lututów, Pajęczno, Piątek, Przedbórz, Rawa Mazowiecka, Rzgów, Sulejów, Tuszyn, Uniejów, Warta, Zelów, Złoczew.
[142] Bełchatów, Działoszyn, Poddębice, Szadek.
[143] Additionally, two towns located in the south-western part of the region (Wieluń and Wieruszów) have access to railway connections, but the railway line that links them is not integrated with the rest of the region's railway network, while the four neighboring districts: Bełchatowski, Pajęczański, Wieluński and Wieruszowski have no passenger railway connections with Łódź.

lines in operation was 1,084.0 km, representing 5.6% of the national network, with 6.3% (68.0 km) of lines remaining **un-electrified**.[144]

The quality of railway infrastructure in the Lodzkie Region has been improving thanks to the ongoing investment process, which has boosted the synthetic indicator of railway transport accessibility. Over the past few years, the infrastructure serving passengers has also improved thanks to targeted investments. New **railway stations and stops** have been built and the existing ones have been modernized, most notably the underground Łódź Fabryczna station with its multimodal transport hub adapted to handle high-speed trains. Another factor that has seen an improvement is **the safety level of the rail network**.

Fig. 49. Solidarity Transport Hub Poland: and nationwide rail network with a 120-minute commute to the STH
Source: own study based on the STH concept

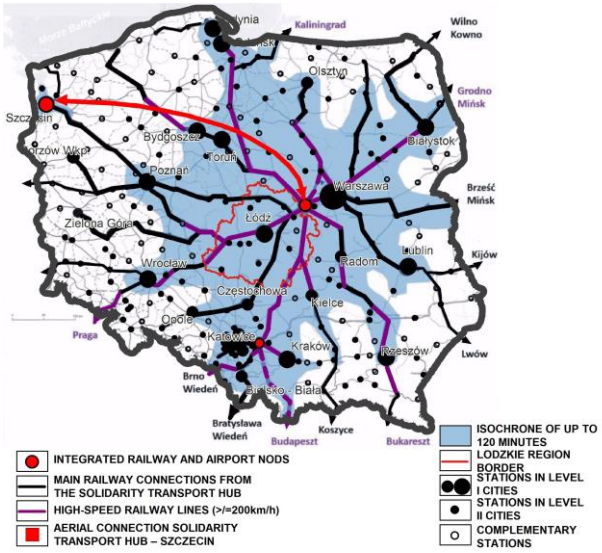
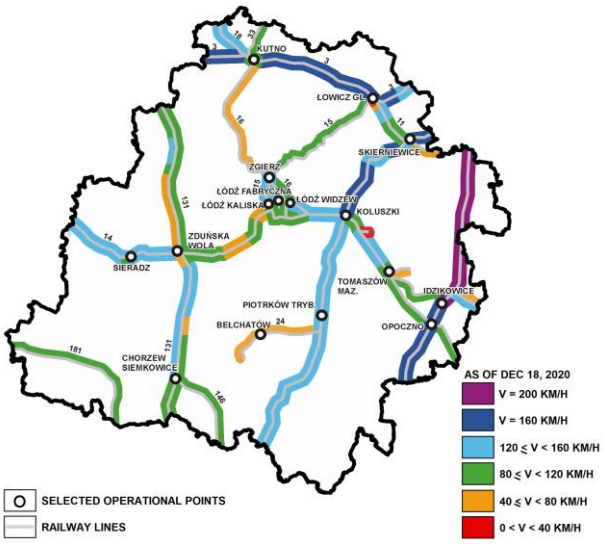


Fig. 50. Maximum speeds of railway lines as of 18 December 2020
Source: Own study based on PKP PLK S.A. data.



A significant problem of the region is the **unfinished high-performance railway system**. Despite the ongoing modernisation process, sections with **reduced route speeds** and **single-track lines,**[145] whose length amounted to 399.0 km (36.8% of all of the region's rail network) in 2019, still pose a barrier to the railway infrastructure's capacity. The peripheral layout of the main lines of international significance (lines no. 1, 3, 4, and 131), as well as the incomplete high-speed rail line, which is part of the TEN-T network, results in **limited connections with many urban centers** in Poland and international destinations (Prague and Berlin). Additionally, the decommissioning of the Piotrków Trybunalski - Bełchatów railway line (no. 24) and the exclusion of Wieluń from the regional railway network means that the south-western part of the region is cut off from passenger rail services.[146] One opportunity for the development of railway connections of the highest technical parameters is the construction of **sections leading to the Solidarity Transport Hub,**[147] including the high-speed Warsaw - Solidarity Transport Hub - Łódź - Wrocław/Poznań line, which will enable the operation of high-speed regional traffic, and the **development of new elements of the railway system** affecting the reduction of transport exclusion in the region, including the construction of new lines: Bełchatów - Wieluń, Łódź - Piotrków Trybunalski / Bełchatów, Skierniewice - Rawa Mazowiecka.

[144] No. 24 Piotrków Trybunalski – Bełchatów, No. 25 between Tomaszów Mazowiecki and Opoczno – border with the Świętokrzyskie Region and No. 53 between Tomaszów Mazowiecki and Spała.
[145] Nos. 15, 16, 22, 24, 25, 33, 53, 146, 181.
[146] Within the framework of the first stage of the call for proposals for the Local and Regional Railway Infrastructure Completion Program Kolej+ until 2028, 3 projects submitted for review were from the region of Łódź: "Modernisation and electrification of railway line No. 24 between Piotrków Trybunalski and Bełchatów with an extension to Bogumiłów," "Construction of a line connecting railway line No. 131 (Chorzew Siemkowice) with railway line No. 181 (Wieluń)", "Modernisation and electrification of railway line No. 25 between Tomaszów Mazowiecki and Skarżysko Kamienna" (in partnership with the Świętokrzyskie Region). All 3 projects qualified for the second stage of selection, which resulted in preparation of planning and forecasting studies for the aforementioned projects that will constitute the basis for qualification of projects for co-financing under the Kolej+ program.
[147] According to the "Concept for the preparation and implementation of the investment Solidarity Hub - Central Transport Hub for the Republic of Poland," adopted by Resolution No. 173/2017 of the Council of Ministers dated 7 November 2017.

Moreover, the line layout in the Łódź Railway Node is inefficient and largely fails to address the needs of residents. For years, a major problem with the railway services in the City of Łódź has been the **lack of a single, centrally located station that would funnel all passenger flows**; currently this role could be played by the Łódź Fabryczna station. One opportunity to integrate the Łódź Railway Node and make a fuller use of the Łódź Fabryczna station is the ongoing construction of the cross-town tunnel under the center of Łódź, along with intermediate stops that will be functionally and spatially linked to the city's transport network.[148] Another vital problem in the context of increasing passenger transport (e.g. the development of the Łódź Agglomeration Railway), shortening journey times (including multimodal passenger journeys), improving the accessibility of rail transport and minimizing the risk of delays and traffic stoppages, is the limited functionality of the Łódź Kaliska station, which among others results from the shutdown of the eastern viaduct,[149] an insufficient number of railway stops (in particular in strongly urbanised areas),[150] the lack of railway connectors linking the ring railway system, and the small number of collision-free road crossings with railway lines.

Air Transport

Challenge: Low air accessibility of the region

The region is home to one regional airport of international importance (W. Reymont Lodz Airport - PL Łódź), one of eight airports in the country associated in the **TEN-T core network**. The airport can process up to about 2 million passengers per year and is equipped with ILS I.[151]

Despite the expansion of the airport and the increase in its capacity, a **decrease in the number of pax flight operations has been recorded**.[152] In 2019, 1,664 operations (12th in the country) will take be processed at PL Łódź, which is approximately 49.0% less than in 2010 (3,268 operations, 7th in the country). In the same period, the number of air operations in Poland increased by about 66.0%.

Fig. 51. Flight pax operations at PL Łódź against other airports in the country in 2019.
Source: own study based on Civil Aviation Authority data

The offer of regular passenger connections is limited, and transport services are provided by a limited number of carriers, mainly low-cost airlines. The offer of charter flights is likewise far from competitive. The airport also operates training and business flights, cargo and mail transport, and medical flights.

One great opportunity to improve the air accessibility of the Lodzkie Region comes with the concept of the Solidarity Transport Hub that, thanks to its convenient connection via the planned high-speed railway line and the extended A2 motorway, is projected to provide air services to the entire country, including the Lodzkie Region, offering European and intercontinental connections.

[148] These construction works are conducted as part of the project "Streamlining of Łódź Railway Node (TEN-T), Stage II, Section Łódź Fabryczna - Łódź Kaliska/Łódź Żabieniec," which also assumes construction of 3 railway stops: Łódź Śródmieście, Łódź Polesie, Łódź Koziny.
[149] Currently, as part of the project "Improving the accessibility of the E20 and C-E20 main lines by improving the technical condition of the adjacent railway lines," the Łódź Kaliska station is undergoing renovation, including the reconstruction of the eastern viaduct.
[150] The problem will be resolved in the course of implementation of the tasks stipulated in the "Railway stop construction/modernisation program for 2020-2025."
[151] Navigational category for safe flight operations in adverse weather conditions.
[152] Flight operation in passenger air traffic.

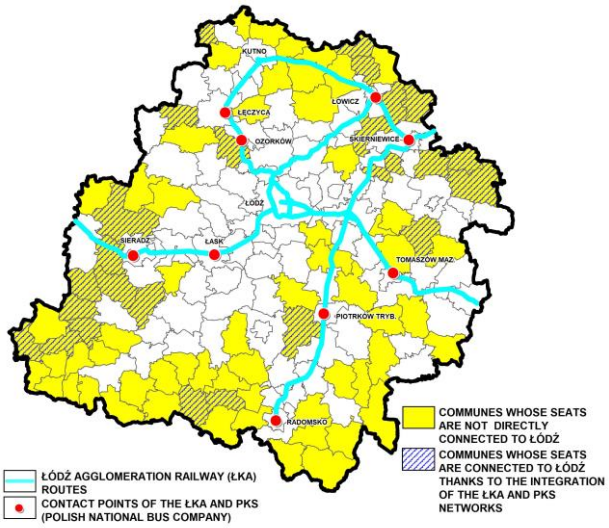
Public transport

Challenge: Underutilisation of public transport

Passenger transport in the region is based on railway and bus transport of local, regional and supra-regional nature, as well as public transport services provided in 26 cities. In the recent years, there has been a noticeable decrease in the **length of public transport lines**, which amounted to 3,611.9 km in 2019 (7th in the country), coupled with a slight increase in passenger transport in the region, with a total of 255.9 million passengers in 2019. Thanks to investments in railway infrastructure, rolling stock and improving the transport offer, **passenger rail transport** has started to play an increasingly important role in the region. Operating since 2014, the Łódź Agglomeration Railway (ŁKA) has provided significant added value to the system of regional rail transport, and thanks to the dynamisation of activities in recent years, it attracted a total of 6,005,000 passengers in 2019. In the recent years, a number of actions have also been taken to address the problem of **fares integration**, including Joint Agglomeration Ticket, Integrated Tickets ŁKA+PKS (bus operator) and Polregio+PKS, mutual validity of train tickets across different regional carriers (ŁKA, Polregio) and MPK Łódź, which made it possible to integrate the railway with the urban transport system. The largest project towards this integration, however, came in 2019 with the creation of the "Integrated Ticket ŁKA+PKS", i.e. a joint train and bus ticket for the services provided by ŁKA and bus carriers operating on lines established under the Public Utility Bus Services Development Fund. In addition, minor contributions **to passenger air traffic** have been made by PL Łódź, which in 2019 handled 241,707 passengers (11th in the country), i.e. about 0.5% of the total domestic traffic.

Fig. 52. Public transport in the Lodzkie Region
Source: own compilation based on data from the Spatial Planning Office of the Lodzkie Region

Fig. 53. Access to Łódź by public transport (rail and bus) in 2020
Source: own compilation based on data from the Spatial Planning Office of the Lodzkie Region



Despite the implementation of numerous investments in public transport infrastructure,[153] its **insufficient quality** is still a significant problem. The region is home to a **limited number of fully functional integrated transfer hubs,**[154] especially those connecting rail and bus transport with urban transport. Another major deficiency is the functioning of the Park&Ride system, especially in the Łódź Agglomeration, and the insufficient preference of public transport in urban traffic - the length of bus lanes in the region amounted to a mere 24.2 km in 2019. Moreover, the quality of the **functional-spatial connections between the railway system and the transport network** is insufficient. The City of Łódź and some units of the Łódź Agglomeration have access to tramway

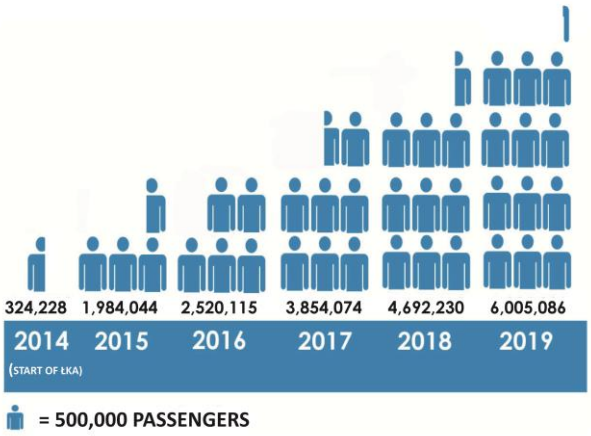
[153] Including, among others: investments in urban transport infrastructure, modernisation of railway station infrastructure, and investments realized by PKP PLK S.A. (based on documentation from the Marshal's Office of the Lodzkie Region) within the scope of construction of multimodal hubs and retrofitting of traveler infrastructure

[154] Integrated transfer hub - a place of convenient change of a means of transport equipped with the necessary passenger infrastructure, in particular: parking spaces, bus stops, ticket sale points, information systems enabling passengers to learn more about timetables, transport lines or the transport network.

transport, however the total length of tram lines has decreased by 18.3 km since 2010 and amounted to 277.7 km (4th the country) in 2019. Despite the great importance of tramway transport in local and agglomeration traffic, its **technical condition** is unsatisfactory and requires renovation. Intervention is especially required with respect to the lines connecting Łódź with other cities of the Agglomeration.[155]

Yet another problem is the **shortage of modern rolling stock,** zero- or low-emission and accessible to people with reduced mobility. In 2010, 57.6% of buses (out of 886 vehicles) and 6.0% of streetcars (out of 514 units) were adapted to the transport of persons with disabilities in the region, while in 2019, those percentages amounted to 76.6% for buses (out of 795 vehicles) (Polish average: 91.5%) and only 21.5% of streetcars (out of 493 units) (Polish average: 38.3%). **The condition of the rolling stock was far superior**, especially for regional (owned by the region, including the Lodz Agglomeration Railway (ŁKA)) and extra-regional (PKP Intercity) connections. The greatest impact on improving the quality of regional rolling stock was exerted by the purchases of modern vehicles for ŁKA (Stadler Flirt 3, Newag Impuls 2); additionally, a project is underway to extend 10 Flirt-type vehicles with a third segment, and to purchase three new hybrid (diesel-electric) vehicles .

Fig. 54. Number of passengers processed by the Łódź Agglomeration Railway in 2014-2019
Source: own study based on data from the Łódź Agglomeration Railway



Another factor that reduces the attractiveness of public transport is the **unsatisfactory offer of public transport,** including a decreasing network of connections and their frequency, which is not adapted to the needs of passengers, especially with respect to bus connections, and as such it results in the creation of 'white spots' in transport accessibility.[156] Over the years, the total length of regular bus transport lines (including long-distance, regional and urban connections) has been decreasing and in 2019 amounted to 28,323.0 km (5.3% of the national network; 10th among all regions). One chance to reduce the number of areas affected by transport exclusion and improve local bus connections came with the launch of several new lines financed from national sources under the Bus Transport Development Fund (2019),[157] whose offer will be dynamically adapted to the transport needs of residents. In 2021, 39 such lines were established throughout the region. Additionally, to improve the quality of services, **bus and train connections have been integrated** at 10 railway stations (Łask, Łęczyca, Łowicz, Ozorków, Piotrków Trybunalski, Radomsko, Sieradz, Skierniewice, Tomaszów Mazowiecki, and Łódź).

The region also suffers from an insufficient offer of regular international train connections, of which the capital of the region is deprived, as the only international connections are available from the Opoczno and Kutno stations. Analyses of **public transport accessibility** have shown that the worst accessibility tends to be found in peripherally located and poorly urbanised areas, far from major transport routes, and in the regions not covered by major carriers (PKS). Moreover, analyses of **public transport services**[158] to Łódź showed that in 2020, 84 communes (about 51% of all communes in the region) had no direct connections with Łódź, which was 18 more than in 2019, undoubtedly due to travel restrictions related to the SARS-CoV-2 pandemic. The areas requiring the elimination of transport exclusion, characterized by the lowest accessibility in 2020, were located peripherally, primarily in the southern, south-western, and north-eastern parts of the region.

[155] As part of the modernisation and reconstruction of the Regional Tram, projects are being implemented in the following sections: Łódź (city border) - Pabianice, and Łódź (city border) - Zgierz (Pl. Kilińskiego), with preparatory works in progress for the sections: Łódź (city border) - Konstantynów Łódzki (Pl. Wolności), and Łódź (Zdrowie) - Łódź (city border).
[156] Additional reduction in passenger network was caused by restrictions resulting from the SARS-CoV-2 pandemic in 2020.
[157] A government fund introduced in 2019 to subsidize the restoration of local bus services in disconnected areas.
[158] On the basis of timetables of regular bus lines (PKS, BUS) and regular railway lines.

Insufficient public awareness with respect to the principles of sustainable mobility and development is a significant problem in the context of growing automotive pressure, especially in city centers, and the attendant adverse effects related to congestion, poor air quality and noise pollution. Despite many investments in public transport and the **development of bicycle transport**,[159] including public bicycle rental systems,[160] the use of individual car transport is still high.

Freight transport and logistics services

Challenge: Growing demand for freight transport intermodality and logistics services

The region's location at the intersection of two core trans-European transport network corridors TEN-T, as well as the transport infrastructure investments implemented in recent years, have increased the economic attractiveness of the Lodzkie Region, stimulating its presence on the global and European map of freight flows.

Fig. 55. Freight transport and logistics in the Lodzkie Region
Source: own study based on Spatial Planning Office of the Lodzkie Region

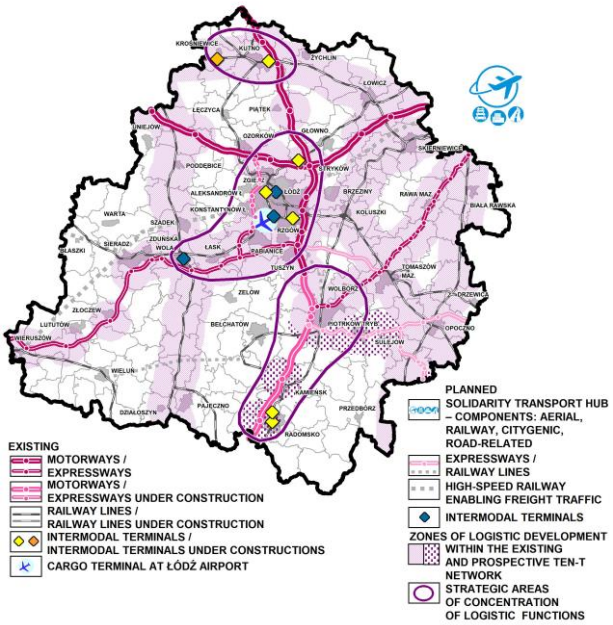
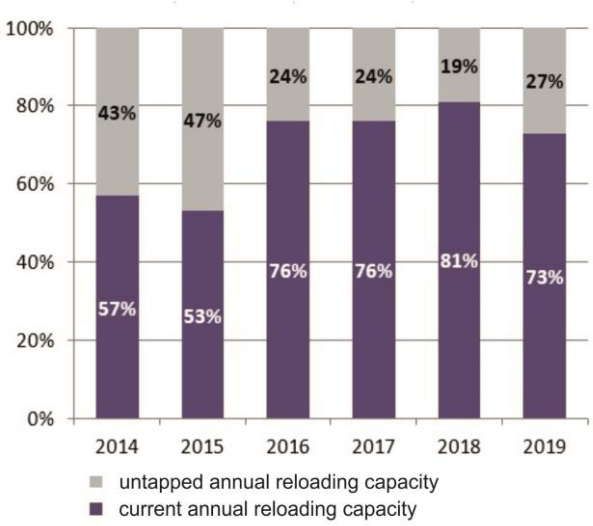


Fig. 56. Loading capacity of intermodal terminals in the Lodzkie Region in 2014-2019 [expressed in %]
Source: Own study based on data from terminal operators



Rail freight transport in the region is carried out along the routes covered by international AGTC agreements:[161] CE65, C65/1, CE20 (TEN-T core network), and C65/2. Moreover, two **International Freight Corridors (RFC-Rail Freight Corridors)** pass through the region: RFC5 Baltic-Adriatic (lines 131 and 146) and RFC8 North Sea-Baltic (lines 1, 3, 11, 12, 14, 17, 25, and 539), which creates a potential for further freight market development in the region. There are 6 **road and rail terminals** in the Lodzkie Region (including the facilities

[159] The length of bikeways has been steadily increasing, from 287.4 km in 2011 to 769.2 km in 2018 (8th in the country).
[160] The region has seen the implementation of the Regional Public Bicycle ("Rowerowe Łódzkie") system, covering the areas of Koluszki, Kutno, Łask, Łowicz, Łódź, Pabianice, Sieradz, Skierniewice, Zduńska Wola, Zgierz. Moreover, communal bicycle systems operate in Łódź and Piotrków Trybunalski.
[161] Agreement on Main International Combined Transport Railway Lines and Associated Facilities.

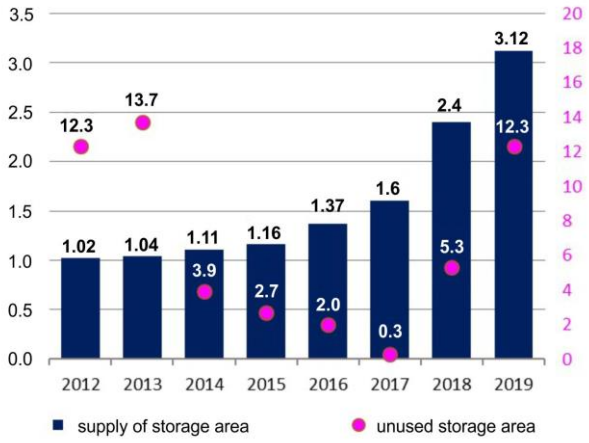
incorporated in the TEN-T network)[162] offering an extensive network of **regular European and intercontinental intermodal connections.**[163]

Between 2014 and 2019, the annual **reloading capacity of terminals**[164] in the Lodzkie Region increased by over 28.0%, from 528,452 TEU to 680,000 TEU (amounting to about 18.5% of the annual reloading capacity of land terminals in Poland). The volume of **processed transshipments** in 2014-2019 increased by 65.0%, from 298,999 TEU to 494,129 TEU. The utilisation of available terminal capacity has been steadily increasing: in 2014, transshipments processed at the terminals utilized 57.0% of their handling capacity, and in 2019, that rate grew to about 73.0%. Increasing volumes of completed transshipments lead to the **exhaustion of intermodal terminals' capacity,** which may constitute an infrastructural barrier to further development of intermodal freight transport in the region. Additional barriers to the future growth of the terminal infrastructure are tied to the limited capacity of rail lines leading to container terminals, as well as "last mile" infrastructure.

Since 2009, PL Łódź has also been home to a **cargo terminal**, whose main problem involves transporting the cleared cargo to intercontinental hubs (RFS - Road Feeder Service) using road infrastructure.

The Lodzkie Region is **one of the largest areas of logistics operations** in Poland. There are warehouse parks dedicated to multiple tenants (multi-tenant parks),[165] with the highest concentration in the area of Łódź, Stryków, Kutno, Radomsko and Piotrków Trybunalski. The total area of **warehouse parks developed in the multi-tenant and build-to-suit (BTS) formulas**[166] at the end of 2019 amounted to 3.12 million m2 (3rd in the country) and accounted for about 16% of the total warehouse stock in the country, with a vacancy rate of 12.3%.[167] In the period between 2012 and 2019, the supply of space of these parks increased by 2.1 million m2, or about 206%; in 2018-2019 alone, developers delivered about 1.52 million m2 of state-of-the-art warehouse space, catering to the needs of a wide range of tenants.[168]

Fig. 57. Supply of multi-tenant and BTS warehouse space [mln m²] and vacancy rate [%] in the Lodzkie Region in 2012-2019
Source: Own compilation based on Coliers International data



Based on the potential related to the concentration of logistic services (including multi-tenant and build-to-suit warehouse facilities), the location of intermodal terminals, and the saturation with other transport infrastructure for logistic chains and goods distribution, three **strategic regions of logistics functions concentration** can be identified in the region: Stryków - Łódź - Zduńska Wola, Kutno, and Piotrków Trybunalski - Radomsko. However, despite the high investment dynamic, the enormous demand for logistics services may produce new challenges for the Lodzkie Region in terms of **long-term response to the high demand for warehouse space in the area**.

[162] TEN-T core network - 2 facilities in Łódź; TEN-T comprehensive network - a facility in Stryków. Additional potential is projected to be provided by the Morawce-Krzewie terminal (currently under construction) and another 3 facilities planned for construction (two in Łódź and one in Zduńska Wola Karsznice).
[163] Most domestic services are offered to Baltic sea terminals and to the facilities in Małaszewicze (on the border with Belarus), Poznań, Brzeg Dolny, Gliwice and Kolbuszowa. The majority of domestic services are offered to Baltic sea terminals and to the following destinations: Małaszewicze (border with Belarus), Poznań, Brzeg Dolny, Gliwice and Kolbuszowa, while international services are offered to Germany, the Netherlands, Belgium, Belarus, the Czech Republic, Slovakia, Romania, Russia, China, South Korea, Vietnam, Mongolia, Kazakhstan and (via the terminals in Brest) Uzbekistan, Turkmenistan, Kyrgyzstan, Mongolia, Japan and Ukraine.
[164] Road and railway terminals.
[165] Warehouse parks rendered available by the developer and intended for lease on the open market.
[166] Customized warehouse facilities dedicated to specific clients, in which the tenant can freely compose the respective modules of warehouse space.
[167] Cushman&Wakefield, Warehousing market in Poland : summary for 2019.
[168] Coliers International, Market Insights Annual Reports 2014-2019.

Power Engineering and Renewable Energy Sources

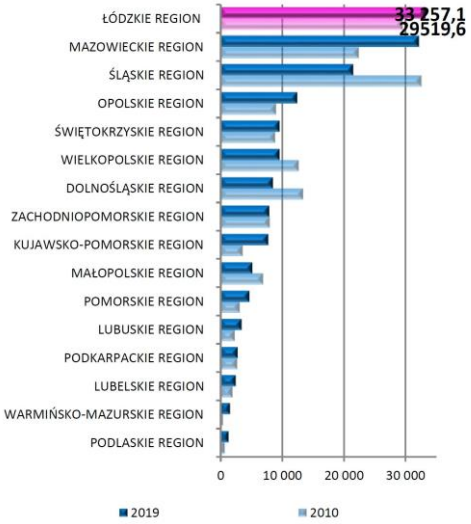
Challenge: Reducing energy production from conventional sources and providing clean, affordable and safe energy

The **power grid system** of the Lodzkie Region consists of: power generation units, mainly the Bełchatów Power Plant, supplemented by smaller Łódź-based combined heat and power plants, hydroelectric power plants, industrial power plants and numerous RES installations, as well as an extensive **network of extra-high and high-voltage lines,** among others.

The region stands out in the country for its **electricity production**, which comes mainly from conventional sources. Since 2010, the **achievable capacity** of power plants (including from RES) in the Lodzkie Region increased by 1,525.7 MW, amounting to 6,621.5 MW in 2019 (3rd among all regions). In 2010-2019, there was also a significant increase in **electricity production** to 33,257.1 GWh (about 20.3% of national production) (1st in the country). The main energy producer is the **Bełchatów Power Plant**, whose total capacity in 2020 amounted to 5,102 MW. Electricity production in the second quarter of 2020 amounted to 6,306 GWh and decreased by 750 GWh (12%) compared to Q2 2019.

Fig. 58. Power grid system in the Lodzkie Region in 2020
Source: Own study based on data from the Lodzkie Region power plants

Fig. 59. Electricity production in the Lodzkie Region compared to other regions in 2010 and 2019 [GWh].
Source: Own study based on Statistics Poland data



Production of energy from conventional sources in the Lodzkie Region is based on the extraction of lignite deposits in the fields of Bełchatów and Szczerców, and as such poses a **substantial problem in the face of climate change** and Poland's commitments to reduce the share of coal in electricity generation to about 56% (with balanced CO2 emissions tariffs) or 37% (with high CO2 emissions tariffs) by 2030. At the same time, Poland has committed to increase the share of RES in the total energy consumption to 15% by 2020 and to 21% by 2030. Currently, the Lodzkie Region - much like the rest of the country, is characterized by a **relatively low level of RES use.**

In 2019, the Lodzkie Region ranked 6th in the country in terms of installed capacity at RES power plants (707 MW). In relation to 2010 (429.8 GWh), RES energy production in the region increased several times, amounting to 1,805.3 GWh in 2019 (6th in the country). The **share of renewable energy in total electricity production in the region** was only 5.4% (14th in the country), which was due to the large share of energy production from conventional sources.

Currently, the largest share of energy obtained from RES sources in the Lodzkie Region is **wind energy**. In 2019, wind power plants generated 581 MW worth of power, but due to their negative impact on urbanised areas (reduction of land value, noise nuisance) and reduction of scenic values, as well as the flat nature of the region creating mediocre conditions for this type of solutions, it is expected that the dynamics of the location of onshore

power plants will decrease on a national scale in favor of concentrating production in offshore areas with the most favorable wind conditions; on a regional scale, wind farms are projected to be supplanted by other RES branches.

The total capacity of **biomass** thermal electric power plants (Łódź - EC4; Rawa Mazowiecka; Opoczno) and numerous small boiler plants with an installed capacity of about 60 MW in 2019 was also noticeable. The region shows potential for biomass production, which is tied to low valuation soils located in the southern part of the region.

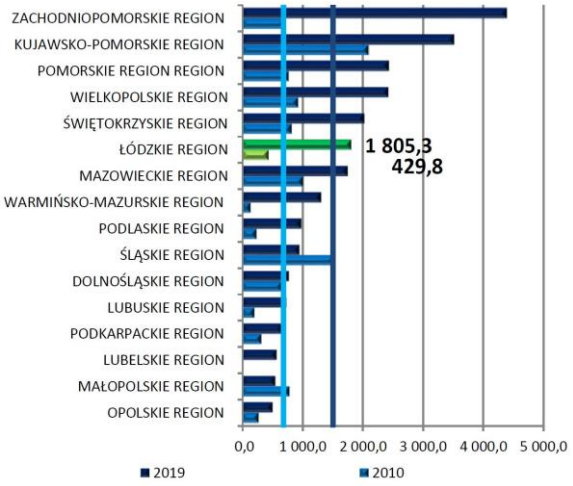
In terms of **geothermal energy**, the Lodzkie Region has not yet fully tapped into its potential, occurring, among others, in the districts: Poddębicki, Łęczycki, Skierniewicki, the city of Skierniewice, Rawski and Sieradzki. At present, geothermal waters are used for heating and recreation/therapeutic purposes in Uniejów, Poddębice and Kleszczów; another installation of this type is currently under construction in Sieradz. Research on their further utilisation is being carried out in Łódź, Konstantynów Łódzki, Skierniewice, Radomsko, Tomaszów Mazowiecki and Zduńska Wola.[169]

Photovoltaic energy, along with large-scale and prosumer energy, is beginning to gain greater importance in the share of energy production from RES in the region. In 2019, the **total capacity of installations** amounted to 43.6 MW. Similarly to biomass, the potential for its production in the region is constituted by low valuation soils or degraded post-industrial areas in the Bełchatów area.

Biogas energy in the region is recovered at landfills and wastewater treatment plants (about 12.9 MW), but it is mainly used to produce energy for own purposes.

Hydroelectric energy is mainly obtained in power plants on the Sulejów and Jeziorsko reservoirs and, to a small extent, on the rivers of the Lodzkie Region (11.1 MW). Due to the lowland nature of the region (low gradient of rivers), continuous decrease of surface water levels, and ever more frequent droughts, hydropower has limited development potential.

Fig. 60. Energy production from RES in the Lodzkie Region compared to other regions in 2010 and 2019 [GWh].
Source: Own study based on Statistics Poland data



In terms of energy services, the region's strong suit is its **extensive network of extra-high and high-voltage grid**. However, the problem is the aging and insufficient development of the power system, mainly with respect to the implementation of smart solutions and adaptation to new RES terminals. Furthermore, the current system is not equipped with energy storage facilities, which are crucial in the dynamic increase of clean energy production.

Gas distribution network and heating

Challenge: Insufficient accessibility of gas and district heating networks

The Lodzkie Region is characterized by a fairly dense network of **high-pressure gas distribution pipelines**, mainly in the central part of the region. Gasification is concentrated along the existing gas pipelines, and most large cities are equipped with **gas distribution networks**. The technical condition of the gas distribution network is gradually improving, but **the aging and insufficient development of the high-pressure gas pipeline system continue to pose a significant challenge**. This problem also applies to the gas distribution network and follows from the low economic viability of connecting new customers in dispersed areas, including rural areas.

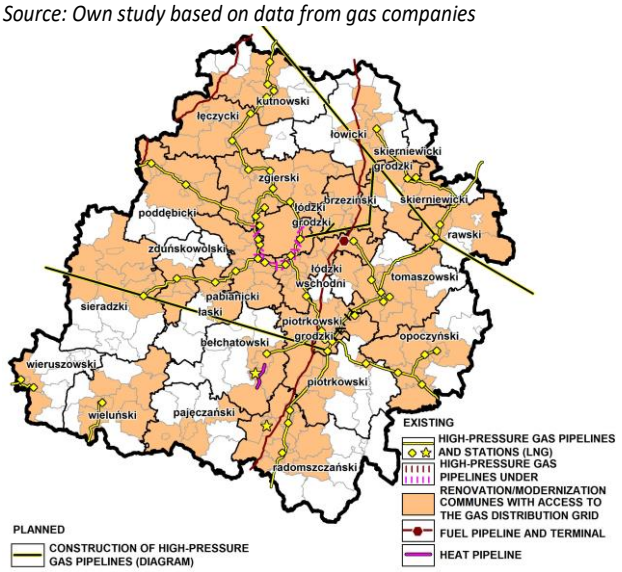
In 2019, 39.6% of the population in the region (14th in the country) used gas from the distribution grid, of which 59.7% lived in urban areas (15th in the country), and only 6.2% in rural areas (14th in the country).

[169] Data as per the Atlas of Geothermal Resources of Mesozoic Formation on Polish Lowlands.

The Lodzkie Region is also characterized by an **insufficient development of LNG**[170] gasification, whose evolution would enable providers to service areas with a low profitability of gas distribution network expansion. In 2019, there were 4 LNG stations in Rogowiec, Rogów, Tomaszów Mazowiecki, and Dobryszyce. One opportunity to improve the situation in this regard is the ongoing construction of 7 stations located in: Budziszewice, Cielądz, Drzewica, Osjaków, Piątek, Szadek and Żychlin, respectively.

Noticeable with regard to district heating is the **insufficient accessibility of district heating networks**, as well as the inadequate availability of the gas distribution network, which could supplement district heating systems.

Fig. 61. Fuel system in the Lodzkie Region in 2020
Source: Own study based on data from gas companies



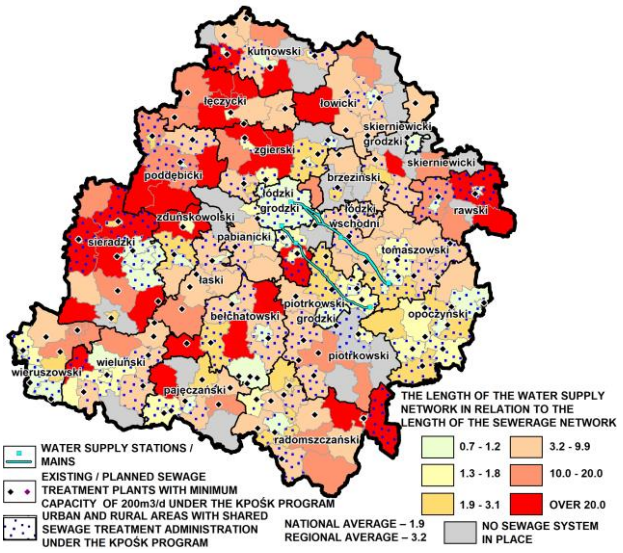
Water and sewage management

Challenge: Regulating the water and sewage management system

Increasing expectations regarding the living standards of the population determine the development of an adequate **water and sewage management**, consistent with environmental protection requirements.

Water systems based on quality deep water continue to be expanded, especially in rural areas, where 92.8% of the population used the water supply system as of 2019 (5th in the country; national average: 85.5%). The percentage of population using the network in the urban areas amounted to 95.3% (13th in the country; national average: 96.6%). A major problem in this regard is the **outdated water supply networks and treatment stations with water intakes** that require to be extended and modernized in order to ensure a constant supply of potable water for the population, while also protecting the region's water resources.

Fig. 62. Water and sewage management in the Lodzkie Region in 2019
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region, Statistics Poland, and the National Program for Urban Waste Water Treatment



In terms of **communal sewage treatment**, 204 mechanical-biological communal wastewater treatment plants were operating in the region as of 2019. The largest sewage treatment plant operating in the Lodzkie Region is the Group Waste-Water Treatment Facility (GOŚ) of the Łódź Urban Agglomeration, which services Łódź, Pabianice, Konstantynów Łódzki, and the commune of Ksawerów.

Currently, all cities in the region discharge wastewater to **mechanical-biological wastewater treatment plants**, of which about 60% used the PUB technology (as of 2019).[171] The implementation of investments under

[170] LNG - Liquefied Natural Gas.
[171] PUB - wastewater treatment technology with increased removal of nutrients, i.e. nitrogen and phosphorus compounds.

the KPOŚK program[172] significantly impacts the development of sewerage systems in 66 sewage agglomerations in the region[173] (including 26 with a p.e. value[174] of 10,000 or higher, which require the use of the PUB technology

at treatment plants). The underlying problem is the **underdevelopment of sewerage systems**, especially those that fail to fully connect the residents of some sewage agglomerations included in the KPOŚK program and in rural areas. As of 2019, 22 communes in the region were not equipped with sewerage networks. The largest disproportions the water supply network in relation to the sewage system occurred in rural areas;[175] in 28 communes, the length of the water supply system exceeded the length of the sewage system 20 times.

Between 2010 and 2019, the **percentage of population served by the sewerage network** in the region's cities increased to 87.2% (15th in the country; national average: 90.5%) and 26.4% in rural areas (14th in the country; national average: 42.2%). The **disparity between the lengths of water supply and sewerage networks** decreased from 4.6 in 2010 to 3.2 in 2019. (15th in the country; national average: 1.9).

In terms of **industrial wastewater production**, there was a 57% decrease in total wastewater discharge from 2010 to 2019 (due to the closure of many industrial plants). The quality of wastewater treatment technology has improved in industrial wastewater treatment plants: in 2010 the share of biologically treated wastewater was only 16.1%, while in 2019 it amounted to 85,4%. One continuous problem is the **small share of industrial plants reusing treated wastewater for production purposes** (equipped with closed water circuits). Between 2010 and 2019, the share of wastewater reused in production processes in discharged wastewater increased by only 1.2 p.p. to 1.6% (against the Polish average increase of 0.2 p.p., i.e. up to 1.4%).

Waste management

Challenge: Improving the waste management system

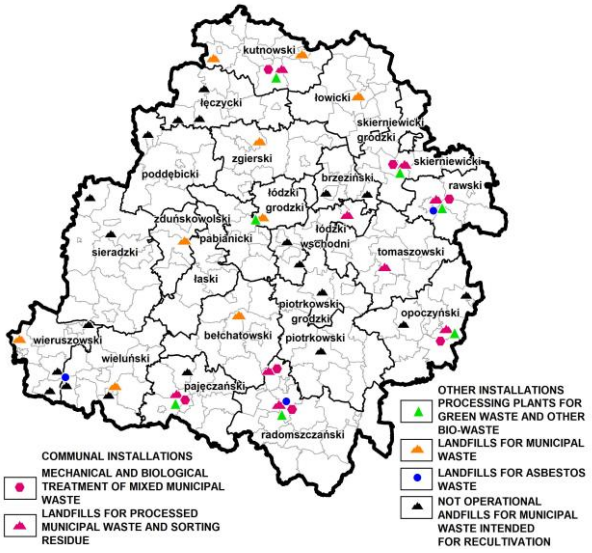
In 2019, communal waste generated in the Lodzkie Region accounted for 9.0% of the total waste generated. The favorable trend of **decreasing the share of communal waste deposited in landfills in the amount of collected mixed waste** continued, and amounted to 38.8% of the total waste (national average: 40.5%), which placed the region 6th in the country.

The **low efficiency of selective waste collection systems** remains a problem. Despite the increase in the **share of selectively collected communal waste** in the total mass of collected waste in the region to 32.6% in 2019 (5th in the country) and the **share of communal waste meant for recycling** to 16.4% in 2019 (national average: 25.0%), these values were still low for both the region and the country.

In the Lodzkie Region, there are no installations for the thermal processing of communal waste and waste derived from the processing of communal waste. The lack of such installations makes it impossible to manage the whitewater fraction, which, due to its high caloric value, cannot be directly deposited in landfills. The energy fraction is not utilized.

Fig. 63. Management of communal waste in the Lodzkie Region in 2020

Source: own study based on data from: Regional Environmental Protection Agency, draft Waste Management Plan for the Lodzkie Region for 2019-2025 (including 2026-2031)



The predominant mass of the total waste generated is industrial waste (91.0%), therefore the problem lies in the **high share of landfilled industrial waste**

[172] National Programme for Municipal Waste Water Treatment (KPOŚK).

[173] Agglomeration (wastewater) - an area where the concentration of population or economic activity is sufficient for communal wastewater to be collected and conveyed to a wastewater treatment plant or a final discharge point for that wastewater - see Article 86 section 3 point 1 of the Water Law Act.

[174] Equivalent Population (p.e.) - a number representing the multiple of the pollutant load in wastewater discharged from industrial and service establishments relative to the unit pollutant load in domestic wastewater discharged from one inhabitant per day.

[175] Rural areas in urban-rural communes and rural communes.

in generated waste, with a simultaneous **decrease in the share of recycled waste** from 14.7% in 2010 to 5.4% in 2019 (against the average drop for Poland from 74.3% to 20.4%).

Another problem is the growing - due to the expansion of sewerage systems - mass of communal sewage sludge generated in the process of wastewater treatment. In 2019, the mass of sludge produced in the region increased by 11.7 p.p. compared to 2010. However, one favorable trend observed in this period was the increase in the amount of reused sludge[176] by 15.5 p.p., i.e. to 51.7% of sludge produced, ranking the region 7th in the country (compared with 11th in 2010).

Another problem is that of closed landfills that have not been recultivated (as of 2019, there were 20 of landfills, including 15 that were undergoing recultivation) and unauthorized dump sites (illegal landfills, degraded post-industrial areas, post-mining pits), which pose a potential threat to the environment (including fires, chemical contamination) and human health and life.

The Lodzkie Region lacks in sufficient capacity to neutralize medical and veterinary waste.

The inventory of **products containing asbestos** and their disposal by storage continued in the past decade.[177] Between 2019 and 2019, there was a 44-fold increase in the amount of asbestos waste disposed of, but a simultaneous 50% increase in the amount of inventoried waste resulted in the fact that over 94% of this waste was still waiting to be disposed of (16th in the country), which indicates a relatively **low waste disposal efficiency.** An additional impediment to the process of clearing the Lodzkie Region of asbestos is the high cost of roofing restoration for the average citizen after the removal of asbestos roofing.

ICT

Challenge: Growing demand for ICT services

The identified needs of many companies, institutions, educational institutions and other entities in the Lodzkie Region with regard to the digitalisation process and development of the Internet and information society (including the need to increase digital competences and the provision and use of e-services) render it indispensable to keep up with the development of ICT infrastructure, while also ensuring the security of ICT networks and system.

Fig. 64. Telecommunications and ICT infrastructure in the Lodzkie Region
Source: Own study based on Office of Electronic Communications data

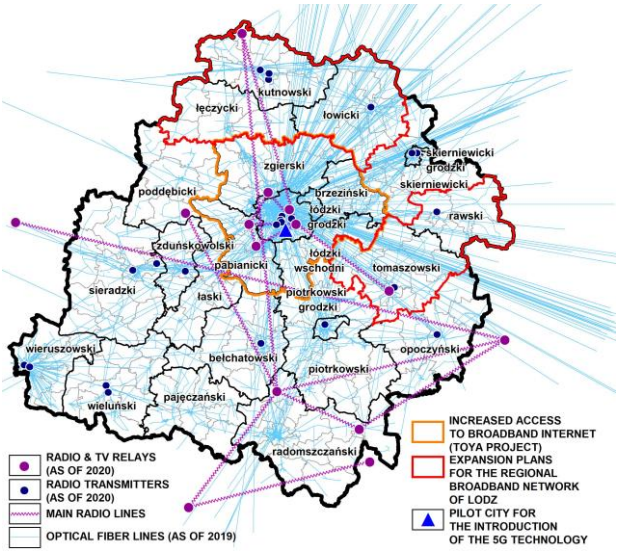
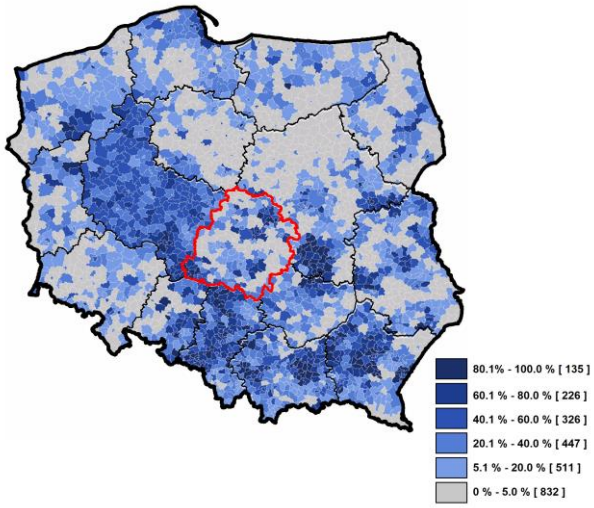


Fig. 65. Broadband Internet coverage (with a minimum connection speed of 100 Mbps) in 2019.
Source: Own study based on Office of Electronic Communications (UKE) data



[176] Sludge is reused in agriculture, land reclamation (including land reclaimed for agricultural purposes, growing composting plants and thermally transformed plants).

[177] Three landfills with storage areas for asbestos products were designated in the region: in Płoszów (Radomsko commune), Pukinin (Rawa Mazowiecka commune) and Młyńsko Wieś (Biała commune).

The development of ICT services in the region is carried out by commercial operators and through projects[178] such as: "LODMAN Communal Computer Network", "Regional Broadband Network of Lodz", "Regional Medical Information System," "Regional Spatial Information System (RSIP)". The implementation of these projects is facilitated by a **fiber-optic (wired) network**[179] that (predominantly) connects urban areas. The problem lies in its **insufficient expansion** in the context of the growing demand for ICT services expressed by residents, entrepreneurs, public administration and other entities from different sectors of the economy. In 2019, about 3/4 of communes in the region did not achieve the threshold of 20% coverage of fixed-line Internet with minimum speeds of at least 100 Mbps (UKE), and only 95.9% of enterprises in the region had **broadband**[180] **Internet access** (12th in the country). Moreover, the unfavorable situation is ascertained by the fact that, as of 2019, only 78.2% of households in the region were equipped with a **device with Internet access** (11th in the country).

Another challenge is the insufficient development of telecommunications using mobile (wireless) technologies, mainly 5G. In 2019, the share of households in the region equipped with a cell phone was 97.8% (4th in the country), of which smartphones accounted for 70.5% (8th in the country). In 2019, about 12% of Polish buildings were deprived of LTE Internet access,[181] with the average for the Lodzkie Region sitting at 10.5% (8th in the country).[182]

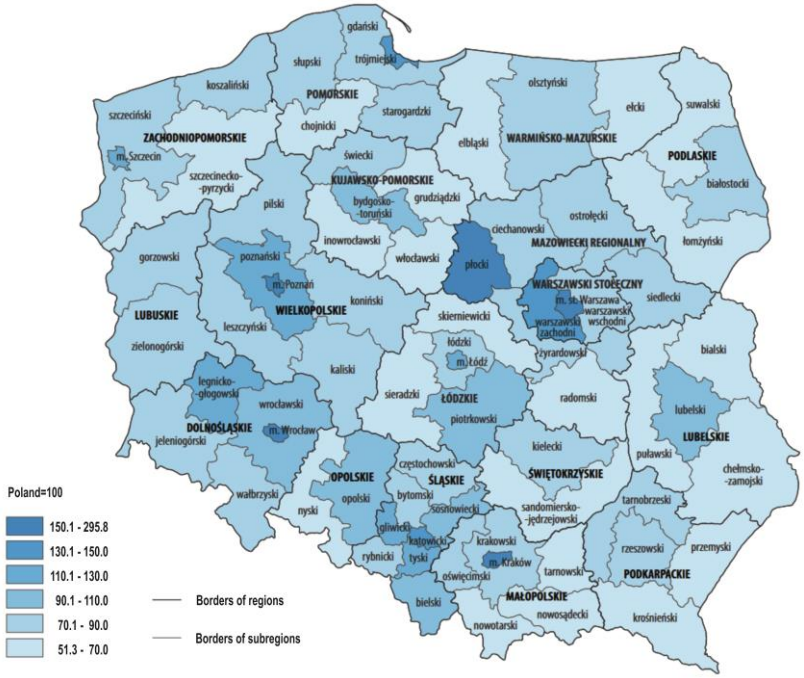
Currently, Europe and Poland are host to the continuous implementation of the 5G Internet. The City of Lodz has been recommended by the Minister of Digital Affairs as the first city to pilot and implement the 5G network in Poland.

Territorial cohesion

Challenge: Addressing territorial disparities and spatial concentration of development problems

The Lodzkie Region is diverse in terms of socio-economic development. One measure of this differentiation is the size and dynamics of GDP changes recorded in both the region and its individual subregions.

Fig. 66. Gross Domestic Product per capita by subregion in 2018 (current prices)
Source: Gross Domestic Product - regional accounts in 2016-2018, Statistics Poland



According to preliminary estimates by Statistics Poland, in 2019 the GDP per capita ratio for the Lodzkie Region amounted to 94.2% of the Polish average (which is the best result for the region ever). This resulted from a higher GDP growth rate than in the case of the national average when compared to 2018. (Lodzkie Region: 108.7%, Poland: 107.8%). Between 2014 and 2018, the Lodzkie Region grew at a slower rate than the Polish average, causing its GDP per capita to decline from 93.7% in 2014 to 93.1% of the national average in 2018. Domestic demand remained the main driver of economic growth, supported by an improving labour market and rising real wages.

[178] These projects provide e-services for students and residents of urban areas with respect to academic knowledge, healthcare, and data exchange between local governments, government offices, public institutions and business entities.
[179] Fiber optic cable - a transparent closed glass fiber structure used to propagate light as an information carrier.
[180] Broadband Internet provides services that connect one to the Internet through a high-speed connection or a high-bandwidth medium. A broadband connection allows parallel transmission of digital data together with analogue or digital voice communication.
[181] LTE (Long Term Evolution) is a wireless data transmission standard that is the successor of the third generation of data transmission systems. It provisions an improvement in the capabilities of mobile telephony by increasing the speed of data transmission, reducing delays, reducing the cost of data transmission, and simplifying the architecture. LTE can reach speeds of up to 300 Mbps.
[182] Report on the state of the telecommunications market in Poland in 2019, Office of Electronic Communications.

In 2018, the Lodzkie Region had a GDP per capita of PLN 51,397. Among the 5 subregions, the highest level of economic development was recorded in the City of Łódź, where the GDP per capita amounted to PLN 70,846 (9th out of 73 subregions in the country). In 2018, the **Łódź subregion caught up with the national average level of GDP per capita of PLN 45,623,** ranking 31st in the country.

A fairly **high level of economic development was also recorded in the Piotrkowski subregion**, where the GDP per capita for 2018 amounted to 51,557 PLN (19th in the country). Unfortunately, due to the declining potential of the mining and energy complex, a decrease in the dynamics of GDP changes has been noticeable - in 2013-2018, the subregion ranked 55th in the country, with the value of 124.7%. The following two subregions - **Skierniewicki and Sieradzki** - **are characterized by a relatively low level of economic development**, appropriate for areas with little industrialisation and devoid of large urban areas. In 2018, the GDP per capita for the Skierniewicki subregion was PLN 38,639 (52nd in the country) while the GDP per capita in the Sieradzki subregion amounted to PLN 36,621 (56th place). The rate of development dynamics between 2013 and 2018 was 126% for the Sieradzki subregion (44th in the country), and 124% for the Skierniewicki subregion (63rd in the country), respectively.

Territorial cohesion is fostered by a **balanced settlement network in which cities play a key role**. Cities are the focal points of socio-economic development, and the functions, institutions, and resources located therein constitute the basis for spatial organisation, including the creation and existence of city-environment relations at various levels (regional, subregional, and local).

Łódź - a metropolitan center of national significance and the capital of the region - is characterized by the largest population and service, economic, and administrative potential among all cities in the region. At the same time, Łódź is a city with a concentration of negative phenomena such as intensive depopulation and population ageing, degradation of urban areas (manifested primarily by the poor technical condition of buildings), and accumulation of social problems. The city addresses these degradation problems through continuous revitalisation process.

Medium-sized cities,[183] which are poles of social and economic development, also play an important role in achieving territorial cohesion of the Lodzkie Region. These cities include Aleksandrów Łódzki, Bełchatów, Kutno, Łask, Łowicz, Ozorków, Opoczno, Pabianice, Piotrków Trybunalski, Radomsko, Rawa Mazowiecka, Sieradz, Skierniewice, Tomaszów Mazowiecki, Wieluń, Zduńska Wola and Zgierz. However, the aforementioned cities are facing many problems of their own, as most of them grapple with unfavorable demographic processes due to depopulation and the aging of society. Some of the factors decreasing their settlement attractiveness include insufficient accessibility to public services, low quality of public space, unsatisfactory quality of the natural environment, including air quality. Some of the aforementioned cities have formed noticeable functional and spatial connections with their closest surroundings; however, these processes are in the early phase of development and require support. In accordance with the provisions of the National Strategy for Regional Development 2030 (NSRD 2030), **9 medium-sized cities are considered to be losing their socio-economic functions** (Kutno, Łask, Opoczno, Ozorków, Radomsko, Sieradz, Tomaszów Mazowiecki, Wieluń, Zduńska Wola).[184]

Other towns, including district seats - Łęczyca, Poddębice, Brzeziny, Pajęczno, Wieruszów - also play an important role in the settlement structure. These towns are diverse in terms of the level of socio-economic development and the scale of problems they experience. Their problems are typically associated with low settlement attractiveness, poorer access to public services, especially to public transport, unsatisfactory level of entrepreneurship development, and lower quality of life.

Rural areas are highly diverse economically. Many of them have retained a typically agricultural character, and a distinctive strip of such communes occurs in the northern part of the region. Highly specialized agriculture also develops in the strip from Brzeziny and Łowicz, through Skierniewice to Rawa Mazowiecka (fruit growing region). Cattle breeding farms are concentrated in the northern and western part of the region there, while the communes located in the strip between Rawa Mazowiecka and Piotrków Trybunalski are known for pig breeding. One significant problem of intensive farming areas is water shortage, especially in the vegetation season.

[183] According to the NSRD, medium-sized cities are cities with a population over 20,000, excluding region capitals, and cities with a population between 15,000 and 20,000 that serve as district seats.

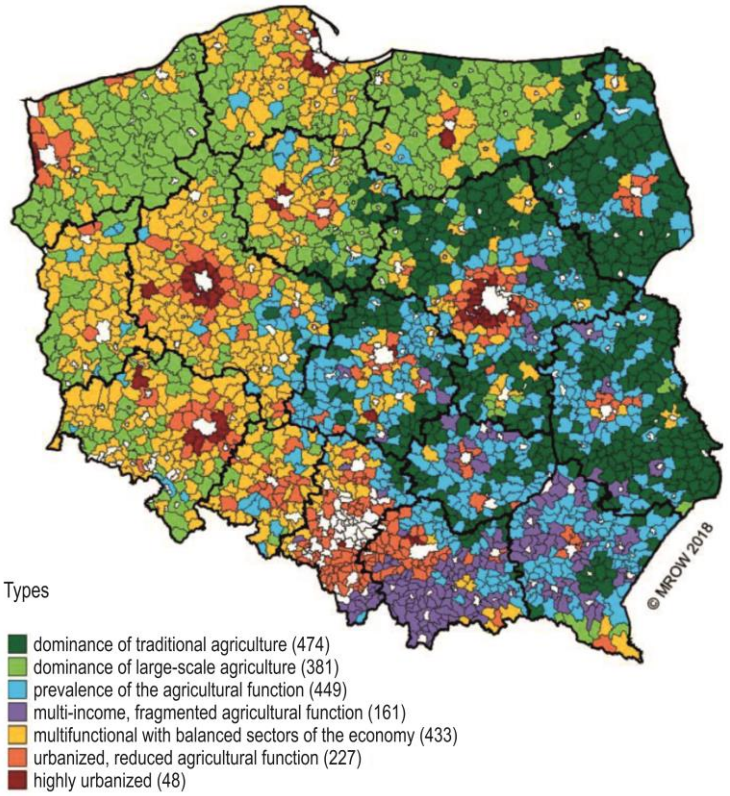
[184] Sources: NSRD 2030 and Updated determination and typology of medium-sized cities losing their socio-economic functions (Śleszyński P., Institute of Geography and Spatial Planning of the Polish Academy of Sciences, Warsaw, 2019).

Some rural communes are distinguished by high natural and scenic values and rich cultural heritage. The most valuable areas in this respect are under legal protection in the form of landscape parks and protected landscape areas. These communes have the greatest potential for developing tourist and recreational functions.

There is also a substantial group of rural communes with a multifunctional character, characterized by a relatively well-developed industry or services sector. These are mostly communes in suburban areas, which are functionally and spatially integrated with district hubs. The suburbanisation phenomenon occurring in those communes often results in spatial conflicts and degradation of areas of high natural and scenic values.

Fig. 67. Spatial distribution of types of rural areas by structure of development components, in the 3rd stage of the study

Source: Monitoring of rural development, stage III, European Fund for the Development of Polish Villages (EFRWP), Institute of Rural and Agricultural Development (IRWiR) of the Polish Academy of Sciences, 2018



According to the Rural Development Monitoring,[185] most of the agricultural areas in the Lodzkie Region belong to the class of traditional or intermediate agriculture, with the predominance of agricultural functions. Not a single commune was identified as a unit dominated by large-scale agriculture. Multifunctional communes, balanced sector-wise, are often located in the vicinity of urban centers. Multifunctional communes with fragmented agriculture are less numerous. Urbanised communes are mainly found in the vicinity of Łódź, while two communities (Kleszczów and Nowosolna) were classified as strongly urbanised. For many years, Nowosolna has been one of the most attractive destinations for migrants from Łódź, while Kleszczów is the richest commune in Poland, thanks to the local power plant.

18 rural communes located on the peripheries of the Lodzkie Region **were recognized as national problem areas at risk of permanent marginalisation,**[186] and this determination fully corresponds to the analyses conducted at the regional level.[187] These communes include: Burzenin, Błaszki, Grabów, Goszczanów, Daszyna, Dąbrowice, Klonowa, Krośniewice, Łanięta, Masłowice, Nowe Ostrowy, Oporów, Przedbórz, Sadkowice, Uniejów, Wielgomłyny, Żychlin, Żytno.

Additionally, at the regional level, 7 rural communes have been designated as areas at risk of permanent marginalisation. These are: Aleksandrów, Budziszewice, Czerniewice, Łęki Szlacheckie, Ręczno, Żarnów, Żelechlinek.

A total of 25 communes in the Lodzkie Region have been designated as the communes at risk of permanent marginalisation in which both social and economic problems accumulate; these communes are also characterized by poorer transport accessibility.

[185] Monitoring rural development, stage III: socio-economic structures, their spatial differentiation and dynamics, European Fund for the Development of Polish Villages (EFRWP), Institute of Rural and Agricultural Development (IRWiR) of the Polish Academy of Sciences, Warsaw 2018.

[186] NSRD 2030 and Updated delimitation of problem areas for 2018 (Śleszyński P., Bański J., Degórski M., Komornicki T. et al, Institute of Geography and Spatial Planning of the Polish Academy of Sciences, Warsaw, 2019).

[187] Development potential of rural areas, Office of Spatial Planning of the Lodzkie Region 2015, updated in 2020.

Urban and rural areas located in the **valleys of the largest rivers of the Lodzkie Region: the Pilica, the Warta and the Bzura**, and in their immediate vicinity, include areas with outstanding natural, landscape and cultural values. In combination with the tourist infrastructure, they create a potential for the development of various forms of leisure, recreation and sport, including active tourism (e.g. cycling, walking, horse riding, canoeing), cultural, conference and business, health (including spa and rehabilitation), nature, educational, family and culinary tourism. The Sulejów Reservoir on the Pilica River and the Jeziorsko Reservoir on the Warta River predispose the area to the development of many forms of leisure activities (including sailing, canoeing and windsurfing), but are affected by the problem of significant water eutrophication. The Pilica Valley is host to the Olympic Preparation Centre - Central Sports Centre in Spała and the Ice Arena in Tomaszów Mazowiecki, while the Warta Valley is home to the Uniejów Thermal Spa. The aforementioned areas are characterized by outstanding cultural heritage, with unique monuments of sacral architecture (e.g. in Łowicz, along with Romanesque temples in Tum, Inowłódz and Sulejów-Podklasztorze), wooden architecture (Wieluń-type churches), defensive architecture (e.g. castles in Łęczyca, Uniejów, Piotrków Trybunalski) and traditions related to the folklore of Łowicz and Opoczno. They clearly stand out on the tourist map of Poland thanks to cultural tourist routes[188] and tourist products certified by the Polish Tourist Organisation.[189]

One specific problem area, and at the same time one of the biggest development challenges in terms of territorial cohesion of the Lodzkie Region, is the **Bełchatów Mining area.** For several dozen years, the development of the Bełchatów Basin has been founded on lignite mining and the production of electricity from this raw material. The Bełchatów Lignite Mine is the largest opencast mine in Poland and one of the largest in Europe. As of the end of 2019, annual coal extraction from the Bełchatów deposit (Szczerców field and Bełchatów field) amounted to a total of 40,788 thousand tons[190] i.e. 77.2% of the national annual lignite output.

The largest baseload power plant in the country, with a capacity of 5 GW, is also located in this area. The annual net electricity production reaches 30 TWh, which constitutes about 20% of the energy produced in the National Power System. The Bełchatów Power Plant ranks among the largest CO2 emitters in the European Union - in 2019, its annual CO2 emissions amounted to 32.7 million Mt (metric tons).[191] PGE Górnictwo i Energetyka Konwencjonalna Bełchatów (PGE GiEK) is the largest employer in the region, hiring over 8 thousand people, including 4.7 thousand in the Mine and 3.0 thousand in the Power Plant (as of 30 June 2020). Additional employment of 5.5 thousand people is guaranteed by subsidiary companies of PGE.[192] The Mining and Power Generation Complex is also supported by companies located in the Bełchatów Basin as well as outside its borders. In the scope of supplies and services in 2020, the Power Plant and Mine cooperated with more than 800 companies. It is estimated that a total of over 20,000 people may be employed in the Bełchatów Mining and Energy Complex and related sectors.

One of the problems of this area is the dependence of its economy on the mining and energy sector, which is responsible for approximately half of the GDP of the Piotrków subregion, i.e. 12% of the GDP of the Lodzkie Region. Apart from being the largest employer in the Bełchatów area, PGE GiEK S.A. directly and indirectly contributes significant financial resources to the local governments and the State Treasury by way of taxes and local fees.

The transition to a climate-neutral economy may result in wide-ranging social and economic effects for the area undergoing the transformation process, including, among others: outflow of population, decrease in employment, decrease in GDP, decrease in the wealth of local government units and inhabitants, decrease in the investment rate, and reduction in internal demand. This will define the area as the Transition Area for the coming years.

The Transition Area is characterized by unfavorable demographic trends related to population decline and aging processes. The process of rapid aging of population will especially affect the city of Bełchatów. The decrease in population is increasingly determined by migration (outflow of population, especially young people), and aggravated by negative natural growth. Limits on the rate of employment in the mining and energy complex may

[188] Amber, Romanesque, Cistercian, and Grunewald routes, respectively.
[189] Tourist Route "Bunker in Konewka," Pilica River Open-Air Museum, "Museum without Slippers" in Tomaszów Mazowiecki, Spała Fair of Antiques and Handicrafts, Borysew Zoo Safari, and Uniejów - First Polish Thermal Spa.
[190] Source: Balance of fossil resources in Poland as of 31 December 2019. State Geological Institute, Warsaw 2020.
[191] Source: European Federation for Transport and Environment.
[192] Source: PGE GiEK S.A. Bełchatów Branch, December 2020.

negatively affect not only the deterioration of the material situation of the residents of the Transition Area, but also (indirectly) the market of consumer goods and services and the rates of unemployment, poverty (including energy poverty) and social exclusion. Poorly diversified and hardly innovative economy is a challenge for the area, in particular for the Bełchatowski district and the City of Bełchatów. Another problem is the unsatisfactory level of social capital, including low attachment to the region resulting from a significant share of incoming populace in the general population.

The Transition Area is characterized by the largest transformations of the lithosphere in Poland (and one of the largest in Europe) resulting from opencast lignite mining. As a result of the investment in the Bełchatów Field area, an 18.0 km long and 250.0-280.0 m deep open pit was created, whose the external dump has the form of an embankment with a height of up to 180.0 m. In 2019, the excavation area of the Bełchatów Field was approximately 1300 ha, while that of the Szczerców Field was 1600 ha. The effects of the negative environmental impact of lignite mining are felt not only within the Bełchatowski district but also in neighboring areas. The cone of depression in the area of the Bełchatów and Szczerców opencast mines covers 482 km2. It poses a major threat to groundwater levels. Significant transformation of landscape in this area is connected with creation of excavations and external dumps, deforestation, exclusion of significant areas from agricultural use, and interference in hydrographic system (shifts of the Widawka and Krasówka river beds). It is expected that the ongoing extraction of lignite deposits in the Bełchatów Field will conclude in 2026, while the projected closure of the Szczerców Field is expected to take place in 2038.

A significant problem in terms of mobility in the Mining and Energy Transition Area is the low accessibility of passenger rail transport, which affects the communication exclusion of the area's residents. Passenger connections include only railway line no. 1, which serves the Piotrków Trybunalski - Radomsko route, while the remaining sections (131 and 146) carry freight traffic only. Moreover, due to poor technical condition of infrastructure (non-electrified and single-track section with low parameters) railway line no. 24 between Piotrków Trybunalski and Zarzecze is excluded from passenger traffic.

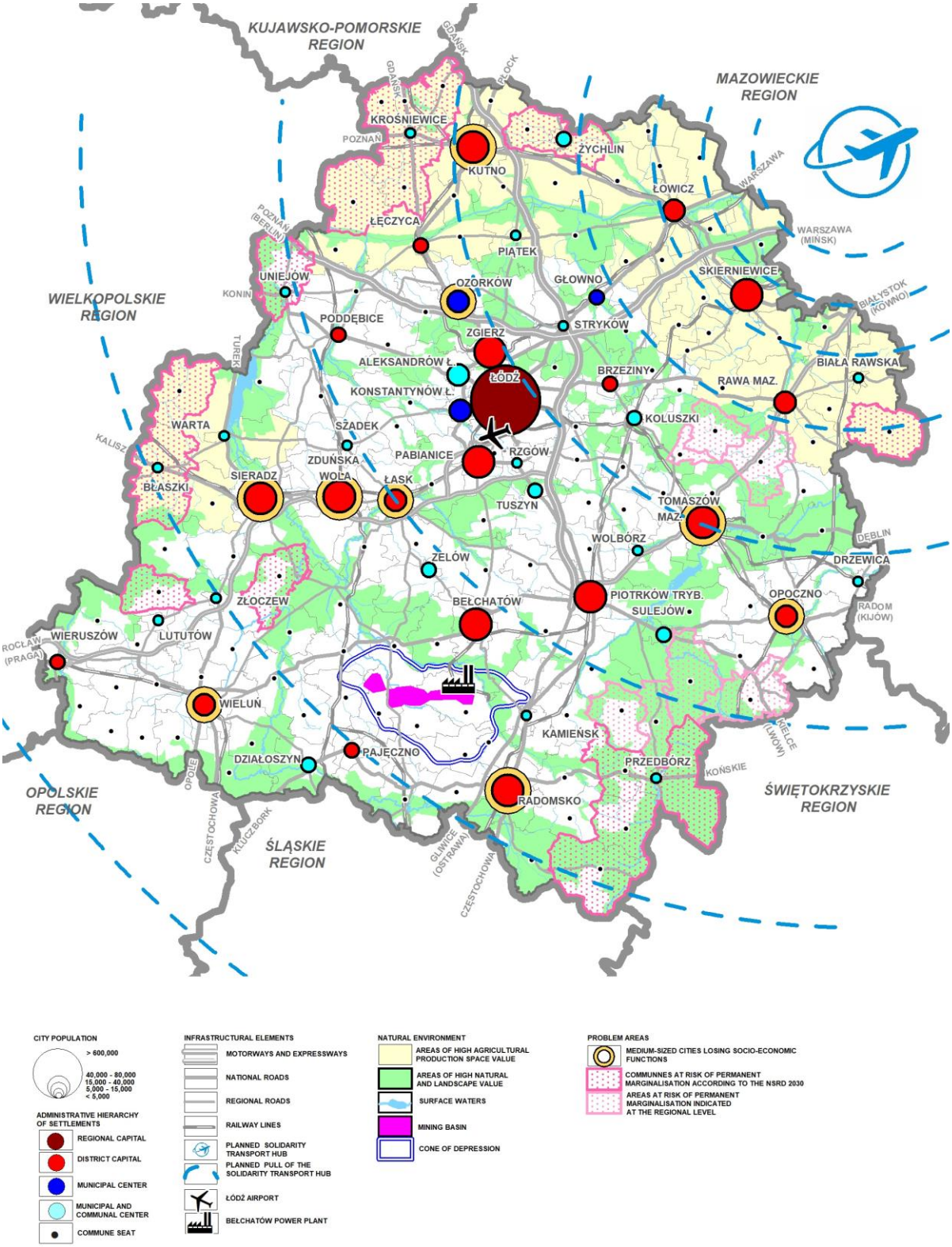
New conditions outlined by the European Green Deal strategy and related to achieving climate neutrality by 2050 make it necessary to reduce CO2 emissions. This will require a gradual reduction in lignite extraction and in the production of electricity from this raw material, which will translate into a reduction in employment, both in the mine and in the power plant, as well as in the mining-related sector. PGE GiEK S.A., the main energy producer in the region, is preparing for such developments.

The main challenges for this area include the development of an innovative and diversified economy, attracting new investors and creating attractive jobs for those leaving the mining and energy sector, women and young and educated people, along with the development of the industrial sector for a clean and circular economy. In the social sphere, the main challenges are the development and support of human capital, including re-branding, improving the skills and professional competencies of employees and creating stable jobs in new sectors of the economy. In the spatial sphere, the main challenges include a rational use of natural resources and the reclamation of post-mining areas, and accelerating the transition to sustainable and intelligent mobility.[193]

A potentially important developmental stimulus, especially for the communes located in the north-eastern part of the region, is the projected implementation of the **Solidarity Transport Hub (STH).** In addition to the development of new railway and road networks to improve accessibility and mobility, the Solidarity Transport Hub is expected to boost the creation of new jobs, increase tax revenue, stimulate innovation and new technologies, and foster the development of industry, business, and tourism.

[193] Draft Territorial Plan for the Just Transition of the Lodzkie Region: Humans - Economy - Space, April 2021.

Fig. 68. Key elements of the functional-spatial structure.
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region.



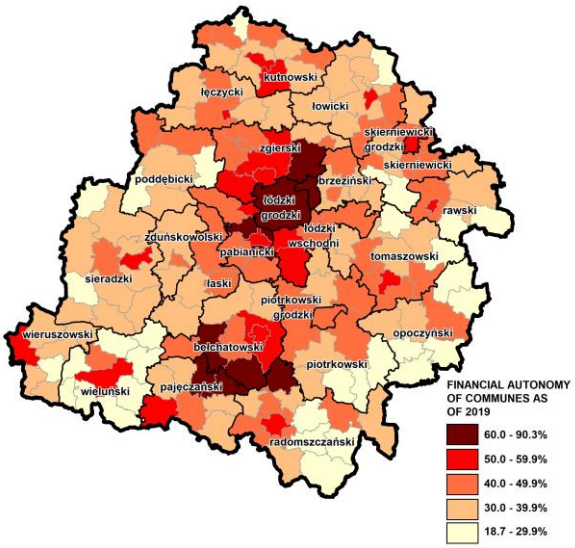
Development Management

Challenges: Insufficient efficiency of the development management system at the regional and local level, and low level of cooperation between local government units, the private sector, and the NGO sector

Efficient management at local government units is predicated on effective, beneficial and efficient execution of development goals and statutory tasks. One among the components of efficient development management is the **finances of local governments**.

The ratio of communes' own revenues to total budget revenues indicates the level of financial **autonomy of local governments**.[194] In 2019, the ratio of own income to total income in 37 out of 177 communes exceeded 50%. Cities and communes with significant economic potential stood out for their highest **financial autonomy ratio**, including: Kleszczów (90.3%), Rząśnia (78.6%), Stryków (68.2%), Szczerców (67.6%), Kamieńsk (65.6%), Sulmierzyce (65.0%). At the opposite end of the scale there were communes (mostly rural) with a ratio not exceeding 30% (33 communes), including one commune with a record low ratio - Aleksandrów (18.7%).

Fig. 69. Financial autonomy of communes as of 2019.
Source: own study based on Statistics Poland data.



A significant part of **public investments** carried out in the Lodzkie Region is **co-financed by EU funds**. When assessing the degree of utilisation of the funds of the Regional Operational Program of the Lodzkie Region for 2014-2020[195], one should note the significant territorial differentiation in terms of the amount of co-financing obtained. The undisputed leader in terms of the amount of funds obtained per capita is the commune of Uniejów (31,061 PLN), followed by Pęczniew (24,926 PLN), while the 3rd place fell to the commune of Masłowice (16,748 PLN). Despite the positive influence of the EU funds on local development, it should be emphasized that not all undertakings are economically effective and address real needs, which may have a negative impact on the current financial situation of the local government unit and limit investment possibilities in the future. On a local scale, this is particularly noticeable in the financing of projects of low developmental significance and disproportionate projected costs-to-benefits ratio.

Efficient **public procurements** contribute to the efficient use of financial resources. **Green public procurements** are an important tool for achieving environmental policy goals. They account for environmental issues, including climate change, resource use, and sustainable consumption and production. **Socially responsible public procurements**[196] are an important element of the public administration's procurement procedures. A specific type of socially responsible procurements are those that contain **social clauses**.[197] However, neither green public procurements nor procurements with social clauses are a common practice in public administration.

The effectiveness of development management is also determined by **rational spatial management**. Ensuring spatial order and land management falls into the scope of the commune's tasks, implemented, among others,

[194] The lower this indicator, the greater the dependence of local government units on the state budget situation, economic prosperity, or rate of unemployment. In communities where over 50% of the budget comes from external sources, it is difficult for local governments to make long-term plans for investments.

[195] As of 31 December 2020, according to the projects whose beneficiaries were communes.

[196] Socially responsible public procurements take into account one or more of the following aspects: promotion of decent work, respect for human rights and labour law, support for social inclusion (including persons with disabilities), social economy and SMEs, promotion of equal opportunities, the principle of general accessibility and eligibility, and inclusion of sustainable criteria (source: Public Procurement Office).

[197] Social clauses are solutions that allow the contracting authority to make the execution of the contract dependent on the fulfillment of certain conditions, which are important in terms of the social benefits achieved through their fulfillment. Above all, the direct purpose of using social clauses is to maintain employment and create new jobs.

through the adoption of **local spatial management plans**. In 2019, 33.0% of the region's area was covered by plans (7th in the country; Polish average: 31.2%). Despite the gradual increase in the area covered by local plans, only 38 communes had 100% of their respective areas covered by plans, while 6 communes adopted no spatial management plans whatsoever. A major problem in terms of rational space management is the omission of plans when implementing strategic investments under the special law; another is the use of administrative decisions on land development conditions in the absence of a plan, which leads to the dispersal of buildings and spatial chaos. Uncontrolled suburbanisation generates costs associated with the need to provide public services and expand the technical infrastructure. It is also a major burden on communal budgets and has a negative impact on environmental and social aspects.

Fig. 70. Scope of local spatial management plans by region in 2019.
Source: own study based on Statistics Poland data.

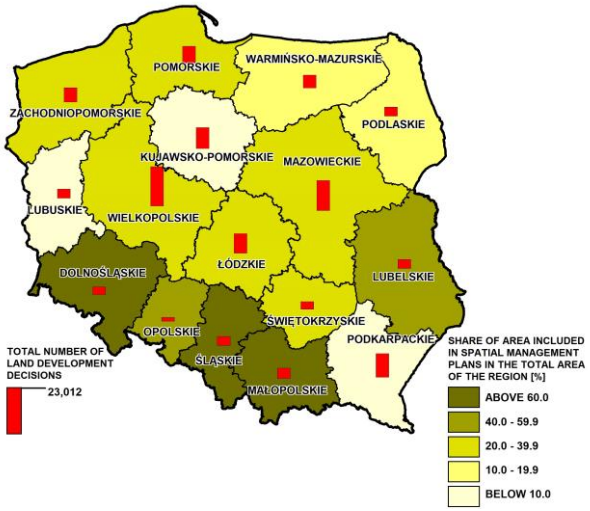
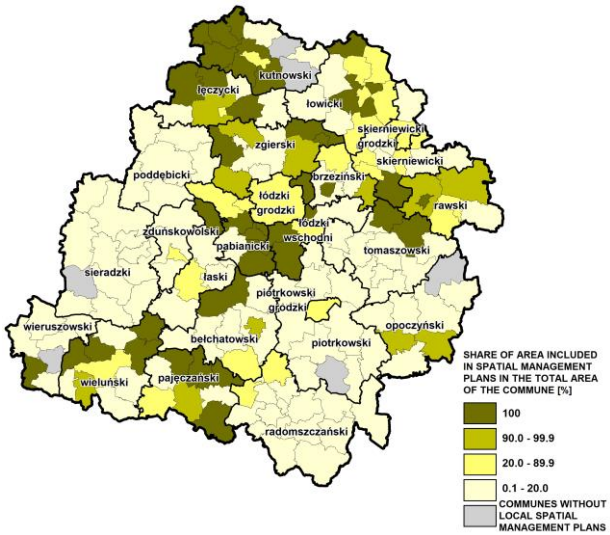


Fig. 71. Scope of local spatial management plans by commune in 2019.
Source: own study based on Statistics Poland data



One of the reasons behind the ineffective spatial and strategic planning and development management is the **insufficient competences of the communal staff**, including in the scope of social dialogue and encouragement of local communities towards greater participation in decision-making with respect to public issues. The use of information and communication technologies in the management process remains far from satisfactory, which translates into **insufficient provision of public e-services**. Despite the noticeable progress in the share of people using public administration services via the Internet (from 26.1% in 2014 to 38.2% in 2020), the region ranked only 9th in the country in this respect (Polish average: 41.9%).

The level of cooperation for regional development between local government units **is still insufficient.** The results of the evaluation of[198] the current Development Strategy of the Lodzkie Region 2020 indicate that one of the reasons for the poorer effects of the implementation of territorial and functional policy is the insufficient level of cooperation between local government units in creating and implementing integrated projects.

As part of the 2014-2020 financial perspective, the Regional Operational Program of the Lodzkie Region launched funds for Integrated Territorial Investments (ITI) for the Łódź Metropolitan Area, which includes communes and cities affiliated within the Łódź Metropolitan Area Association.[199] Thanks to this instrument, it was possible to initiate cooperation between the local government units forming the Association.

In rural areas, the territorial instrument based on the partnership principle - **Community Led Local Development** (CLLD) under the LEADER Initiative of the Rural Development Program 2014-2020 and OP Fisheries and Sea 2014-2020 - was used. It allowed the development of cooperation between local governments and communities at the local level as part of Local Action Groups.

[198] "Mid-term evaluation of the Development Strategy of the Lodzkie Region 2020" - final report of the study, Łódź, November 2017.
[199] The Łódź Metropolitan Area Association was established in 2014 and brings together Łódź and the districts: Brzeziński, Łódzki wschodni (Łódź east), Pabianicki and Zgierski.

However, there is still a need for initiatives aimed at raising the awareness of the importance of mutual cooperation and competence development among employees, including expanding cooperation with supporting institutions (e.g., universities, BEI), which will translate into creating leaders initiating, maintaining, and continuing such cooperation.

The outbreak of the COVID-19 epidemic at the beginning of 2020 highlighted new needs in terms of management efficiency, related to ensuring sanitary-epidemiological safety and counteracting crisis situations. Therefore, it will be necessary to take measures to increase the level of this security, coordinate cooperation of emergency services, and increase public awareness.

IV. VISION OF DEVELOPMENT

The vision of the region reflects the desired state of the Lodzkie Region in the perspective of 2030, with respect to three strategic dimensions of development, i.e. economic, social and spatial; as such, it constitutes **a response to the identified development challenges**. The vision takes into account the changes taking place in the world and the global megatrends that will shape societies and economies in the coming years.

A HARMONIOUSLY DEVELOPING REGION IN THE CENTER OF POLAND,
FRIENDLY TO FAMILIES, RESIDENTS OF CITIES AND RURAL AREAS.
A REGION WHERE MODERN ECONOMY GOES HAND IN HAND
WITH THE PROTECTION OF CULTURAL AND NATURAL VALUES.

MODERN AND COMPETITIVE ECONOMY

The Lodzkie Region effectively uses its endogenous potential and the opportunities resulting from the development of **Industry 4.0**, building a **competitive advantage** on the national and international arena. The SME sector, which dominates in the region, plays an important role in this regard.

The innovative potential of the region is growing, allowing the dynamic adjustment of the economic structure to the highly changeable requirements of the environment and the global trends related to the development of industry 4.0, 5G technology, and **bioeconomy**.

A continuous **internationalisation** of economic entities is taking place, accompanied by the development of **strong R&D centers**. Higher education institutions and the research sector have gained the ability to respond flexibly and quickly, in particular to the needs of **networked circular economy, the leading regional specialisations,** and the needs of the modern services sector.

Higher education institutions and other research entities have established themselves internationally. The image of the region has been strengthened as that of an **R&D hub** that provides a natural base for the current and prospective leaders and main branches of regional and national economy. The attractiveness of the Lodzkie Region for new investors and the **productivity of its economy** have increased significantly.

Also on the rise is the quality of the local **human capital**, with the region's population, including seniors, becoming more active professionally, as the region leads the way in **silver economy**.

The Lodzkie Region has **a well-developed system of lifelong learning and vocational education** that helps it continually strengthen the key competencies of labour resources. **Depopulation processes** are slowing down and the region is becoming an attractive destination for new residents.

CIVIC SOCIETY OF EQUAL OPPORTUNITIES

Residents are the greatest wealth of the Lodzkie Region, regardless of their place of residence and social standing. Families and households generate **satisfactory incomes**, residents have access to housing of adequate standard, and to **high quality public services**. Sufficiently developed public services, including senior services, allow for a long, healthy, prosperous and creative life, while also ensuring respect for human rights and dignity. The **high quality of family ties** and relationships translates into the quality of life and social and cultural involvement of the region's residents.

The region has seen a significant **improvement in the health of its residents**, and the level of social exclusion and poverty has been reduced to a minimum.

The level of **local identity** and a sense of pride derived from living in the Lodzkie Region has been on the rise. **Social trust** and **human solidarity** have increased, which is conducive to the residents' engagement in social activities and voluntary work, especially within their local communities, and their **openness to integration** with persons at risk of exclusion. The inhabitants of the region participate in cultural, tourist, recreational and sporting events organized among others by cultural institutions and non-governmental organisations, which integrate local communities and enable them to establish new social ties at a supra-local level.

The process of **just transition** that provides new economic impulses helps generate attractive jobs, which in turn help increase the standard of living of the region's residents.

ATTRACTIVE AND ACCESSIBLE SPACE

The Lodzkie Region is territorially cohesive, with cities regaining their functions and rural communes rebuilding their potential. **Orderly urbanised areas** are covered by public transport and infrastructure networks. Chaotic suburbanisation processes are being stopped, also in agricultural areas, and dispersed **settlement structures** are becoming more condensed. City centers are being restored to residents and become **attractive spaces** for living, with special attention paid to family needs. Cities and rural areas comply with the **air quality standards.**

The state of cleanliness of the environment has fundamentally improved thanks to an efficient waste management system integrated with the emergence of **circular economy** and the popularisation of production methods that account for environmental factors. The **quality of surface waters** has been radically improving.

Thanks to its improved **adaptability to climate change**, the Lodzkie Region has retained its food production potential. The small retention system is being developed, along with new multifunctional retention reservoirs; **natural flow conditions** are being restored, and water shortages are being gradually reduced. The volume of green areas has expanded significantly, with urban spaces becoming increasingly greener. Life in cities becomes more pleasant thanks to the mitigation of heat waves and flash floods.

The Lodzkie Region is characterized by a coherent system of protection of valuable landscapes and natural and cultural resources. It continuously increases the area of legally protected areas and does its best efforts to preserve biodiversity. The natural and cultural heritage is becoming an important **factor of tourist and recreational interest,** and the region is becoming an attractive destination on the travel map of domestic and foreign tourists. Łódź is becoming an important European center of post-industrial cultural heritage.

The region has also seen the emergence of green networks of attractively arranged green areas, as the region strives to become the **green garden of Poland**.

Residents of cities and rural areas alike live in a clean, friendly, accessible, and sustainable environment. The region provides an attractive and diverse space for individual and collective physical activity and recreation for all age groups and persons with disabilities.

One catalyst accelerating the international attractiveness of the region and its assets is the **Solidarity Transport Hub Poland** and the well-developed **system of high-performance railway lines**. The bipolar system of the Warsaw and Łódź metropolitan areas has been strengthened. The region's **road network**, particularly under the TEN-T trans-European transport network, is being expanded and supplemented, and the hitherto peripheral

areas are being incorporated in a coherent socio-economic system. The region has also established itself a logistic node of European importance.

Fig. 72. Diagram of strategic elements of the transport and logistics system

Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

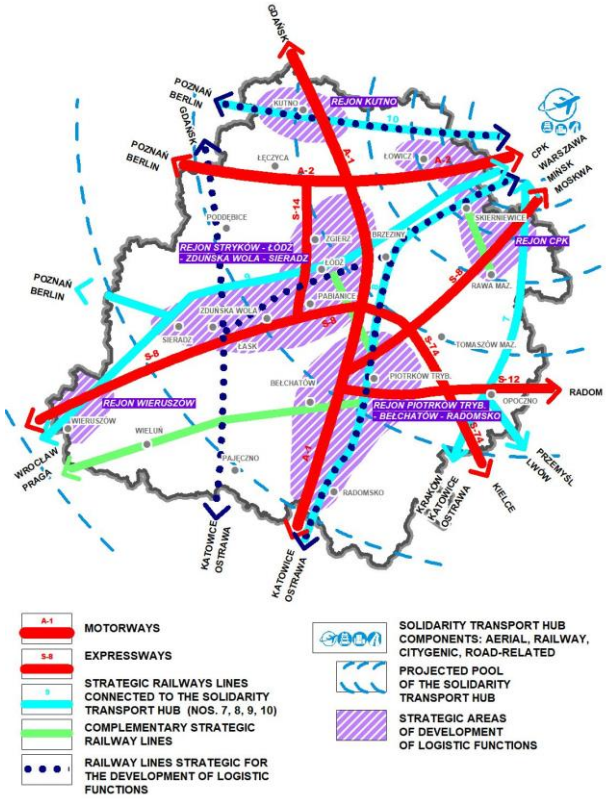


Fig. 73. Diagram of strategic elements of the natural environment and agriculture

Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

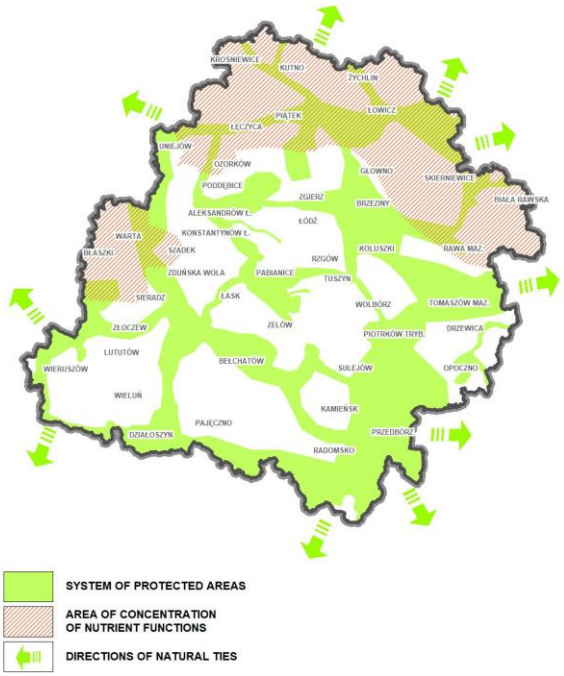


Fig. 74. Diagram of the settlement system

Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

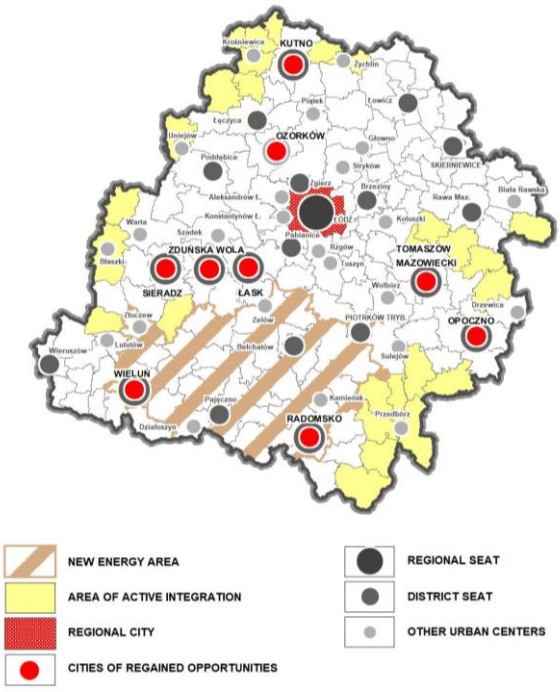
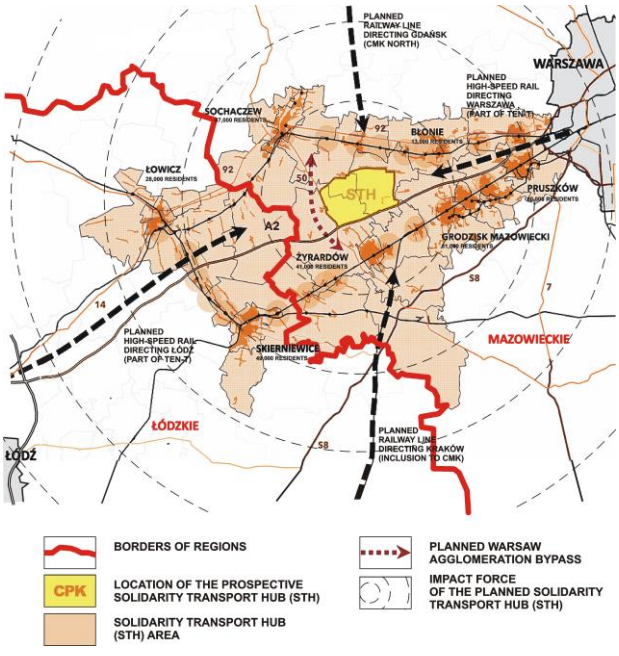


Fig. 75. Schematic formation of connections within the bipolar system Łódź - Solidarity Transport Hub - Warsaw

Source: own study based on Solidarity Transport Hub data.



V. STRUCTURE OF STRATEGY OBJECTIVES

The strategic part of the document contains a hierarchical and coherent system of the development plans of the Lodzkie Region, which consists of strategic objectives, operational objectives and planned measures enabling the achievement of the assumed vision of development. The Strategy identifies **three strategic objectives across three areas (economic, social and spatial):**

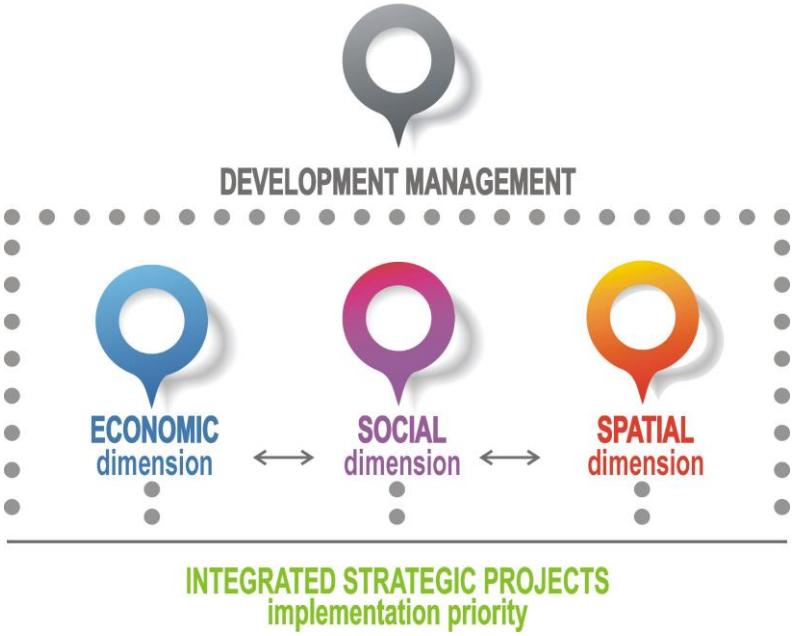
- Modern and competitive economy,
- Civic society of equal opportunities,
- Attractive and accessible space.

The strategic objectives of the development policy of the Lodzkie Region determine the necessary actions (within the scope of the 2030 perspective) that allow the region to realize its development potential and mitigate development barriers diagnosed as the strategic development challenges. The objectives refer to actions implemented in the economic, social and spatial spheres, taking into account the **interdependence of development processes** occurring within these three spheres.

Additionally, one **horizontal objective** has been identified, i.e. striving towards an **efficient and responsible regional management**. Effective actions taken in the management sphere will have a positive impact on the implementation of the aforementioned strategic objectives, enabling an effective implementation of the Strategy and optimisation of development processes. Within the framework of this objective, activities will be focused on improving the functioning of public administration and development of cooperation at different levels of management, especially between the regional and local authorities.

The essence of this objective will be to **conduct an integrated development policy in accordance with the idea of sustainable development** by strengthening the endogenic potential of cities and rural areas, increasing their settlement attractiveness, eliminating barriers for development, and preventing peripheralisation. Crucial in this respect are the principles of environmental protection, including the protection of the most valuable elements of the natural environment, cultural heritage and landscape. A sustainable development policy will allow the region to meet the needs of its current residents and preserve the most valuable elements of its natural environment for future generations. The synergy effect in the social and economic development processes will be achieved while respecting the scenic values of the region.

The implementation of the strategic development policy is addressed to all the entities operating in the Lodzkie Region and is envisioned to take place throughout its territory.



STRATEGIC OBJECTIVES	OPERATIONAL OBJECTIVE	PLANNED MEASURES
1. ECONOMIC dimension MODERN AND COMPETITIVE ECONOMY	1.1. INCREASING RESEARCH AND INNOVATION POTENTIAL	1.1.1. Developing the R&D sector, particularly for smart specialisations
		1.1.2 Intensifying cooperation between the R&D sector and entrepreneurs
		1.1.3. Developing regional smart specialisations
		1.1.4. Leveraging existing and emerging potentials to stimulate economic development
	1.2. IMPROVING THE QUALITY OF HUMAN CAPITAL	1.2.1. Increasing the use of the potential of higher education institutions in the Lodzkie Region
		1.2.2. Popularizing vocational education and lifelong learning
		1.2.3. Activating professionally inactive people, including the unemployed
		1.2.4. Developing key competencies
	1.3. SUPPORTING THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED ENTERPRISES	1.3.1. Increasing the competitiveness of enterprises
		1.3.2. Supporting the networking of SMEs
		1.3.3. Improving the effectiveness and efficiency of BEI operations
	1.4. DEVELOPING THE AGRICULTURAL SECTOR AND INCREASING ITS COMPETITIVENESS	1.4.1. Increasing the efficiency and profitability of agricultural production
		1.4.2 Maintaining a high level of quality of agri-food products
2. SOCIAL dimension CIVIC SOCIETY OF EQUAL OPPORTUNITIES	2.1. DEVELOPING SOCIAL CAPITAL	2.1.1. Building social trust, developing social and civic awareness, promoting family values
		2.1.2. Increasing cultural participation and developing cultural services
		2.1.3. Developing the sports, tourism and recreation sector
		2.1.4. Strengthening regional and local identity
	2.2. IMPROVING POPULATION HEALTH	2.2.1. Increasing health awareness and strengthening prevention efforts
		2.2.2. Improving the accessibility and quality of healthcare services
		2.2.3. Improving the accessibility of long-term and psychiatric care
	2.3. REDUCING POVERTY AND SOCIAL EXCLUSION	2.3.1. Supporting families and individuals at risk of poverty and exclusion
		2.3.2. Developing facilities and services provided by local communities (deinstitutionalisation of services)
		2.3.3. Developing social and solidarity economy
3. SPATIAL dimension ATTRACTIVE AND ACCESSIBLE SPACE	3.1. ADAPTING TO CLIMATE CHANGE AND IMPROVING THE QUALITY OF ENVIRONMENTAL RESOURCES	3.1.1. Improving air quality
		3.1.2. Protecting water resources and improving their quality
		3.1.3. Counteracting the effects of drought and decreasing water scarcity
		3.1.4. Mitigating the effects of extreme weather phenomena
	3.2. PROTECTING AND SHAPING LANDSCAPE	3.2.1. Protecting and shaping the value of cultural heritage
		3.2.2. Protecting and using natural and landscape assets
		3.2.3. Revitalisation, enlargement and enrichment of space with attractively arranged green areas
	3.3. INCREASED TRANSPORT ACCESSIBILITY	3.3.1. Improving the road accessibility of the region
		3.3.2. Integrating the Lodzkie Region in the high-speed railway system and increasing the rail accessibility of the region
		3.3.3. Increasing the airline accessibility of the region
		3.3.4. Creating an attractive and competitive offer of public transport
		3.3.5. Increasing the intermodality of freight transport and developing logistic services
	3.4. MODERN ENERGY SECTOR IN THE LODZKIE REGION	3.4.1. Developing a strategic electric energy system
		3.4.2. Developing a strategic gas distribution system
	3.5. RATIONALISATION OF WASTE MANAGEMENT	3.5.1. Developing infrastructure towards circular economy
		3.5.2. Reducing the negative impact of waste on environment
		3.5.3. Improving the efficiency of asbestos removal from the Lodzkie Region
	3.6. INCREASED ACCESSIBILITY OF ICT SERVICES	3.6.1. Developing wired and wireless ICT infrastructure
		3.6.2. Developing, implementing and disseminating modern e-services

HORIZONTAL OBJECTIVE	PLANNED MEASURES
DEVELOPMENT MANAGEMENT EFFICIENT AND RESPONSIBLE REGIONAL MANAGEMENT	a. Improving the knowledge and skills in planning and management of the development of local government employees at all levels
	b. Popularizing the use of ICT technologies in development management
	c. Strengthening the cooperation and partnership of local governments
	d. Implementing an integrated and territorially oriented policy of sustainable spatial development

1. ECONOMIC SPHERE - STRATEGIC OBJECTIVE: MODERN AND COMPETITIVE ECONOMY

A key challenge for the economy of the Lodzkie Region is to **dynamise the transformation towards a knowledge-based economy** that delivers modern and competitive products and services. The success of the actions taken in the economic sphere will determine the future rank of the region on the national and European arena, as well as its attractiveness to current and prospective residents and investors, their needs and ambitions. **A modern and competitive economy** is tantamount with **high-quality jobs** that provide a strong incentive, increasing the region's attractiveness as a place of living. Analyses conducted in the field of innovation diffusion in the Lodzkie Region[200] indicate that the main problems revolve around three issues: trust between partners of the innovation system, efficiency and accessibility of public administration, and education and qualifications of the region's residents.

Achieving this goal requires taking action in four main areas. The starting point is the **diffusion of innovation** into the entire economy of the region. There is room for innovation in every economic activity. The Development Strategy of the Lodzkie Region 2030 supports innovation across all fields, starting from small organisational solutions and ending with the implementation of large research projects. An indispensable factor in this respect is the high quality **human capital**, whose readiness to create, implement and use innovation will determine the success of the objective. The area of special support in this regard are **small and medium enterprises**, which constitute 99% of the economic entities in the region, and are often burdened with low competitiveness, lack of innovation, and reluctance towards cooperation. The last pillar in building modern and competitive economy is highly profitable **agriculture and agri-food processing**, offering products of the highest quality.

Operational objective 1.1: Increasing research and innovation potential

The development of a modern and competitive economy is determined by the ability to create and absorb innovation and by the potential of research and development works. Innovation requires support on many levels. The greatest emphasis will be placed on applied research that most strongly contributes to the growth of competitiveness and enables technological transformation of the economy. At the same time, **the development of human resources** together with the **modernisation of research and development facilities** will create conditions for conducting scientific research on a larger scale.

Thanks to research and development initiatives, the companies operating within the **regional smart specialisations** of the Lodzkie Region will be able to offer modern, innovative, and globally competitive products. Their quality and recognition will positively affect the image of the Lodzkie Region as a host to modern and competitive economy. An opportunity for the economic development of the region will also be provided by **new regional smart specialisations identified by means of entrepreneurial discovery process**.

Research and development works, including a comprehensive application of **information and communication technologies (ICT),** will contribute to further development of **bioeconomy, reindustrialisation** and activation of new potentials, e.g. in the field of c**ircular economy** and **Industry 4.0.**

The region's pro-innovation policy will be directed towards **strengthening cooperation** between research institutions, academic centers, local governments, entrepreneurs and other stakeholders in the regional innovation ecosystem. The **work of technology brokers will be intensifie**d in the activities of business environment institutions, which will make it possible to strengthen the cooperation of the R&D sector with entrepreneurs.

Planned measures :

1.1.1. Developing the R&D sector, particularly for smart specialisations, among others by:

- developing research facilities, support for R&D units, with particular emphasis on R&D in enterprises,

[200] Analysis of innovation diffusion bottlenecks in the Lodzkie Region, Spatial Planning Office of the Lodzkie Region November 2020.

- supporting research of implementation character, commercialisation of research results and support for establishing contacts at home and abroad,
- developing human resources in higher education institutions, R&D units and R&D departments of enterprises.

1.1.2. Intensifying cooperation between the R&D sector and entrepreneurs, among others by:

- increasing the involvement of business environment institutions in the cooperation between R&D units and entrepreneurs,
- supporting the activity of technology brokers and promotion of the idea of "technology brokering",
- promotion of best practices in the field of cooperation between R&D and enterprises, development of laboratory facilities through support of business environment institutions, with special emphasis on cooperation with SMEs.

1.1.3. Developing regional smart specialisations, among others by:

- increasing the cooperation between the spheres of science, business, public administration and supporting institutions,
- increasing the internationalisation of enterprises, including, among others, support for entering new markets, development of e-exports,[201] participation in trade fairs and foreign missions,
- creating a positive image and promotion of enterprises operating in the area of regional smart specialisations,
- using the process of entrepreneurial discovery for the purpose of identifying new regional smart specialisations,
- supporting the development of modern technologies, including key enabling technologies (KETs),[202] as well as the diffusion of innovative solutions for the economy.

1.1.4. Leveraging existing and emerging potentials to stimulate economic development, among others by:

- supporting the use of information and communication technologies (ICT) for the creation of new advanced products and services, e.g. through the idea of a Digital Innovation Hub,
- supporting the implementation of solutions in the bioeconomy, using biotechnological and chemical processes, bio-products and products of specialized chemistry and environmental engineering,
- supporting the reindustrialisation of the region's economy, including the use of solutions from the field of Industry 4.0, e.g. advanced systems of integration, analysis and data processing, the Industrial Internet of Things,[203] cooperating robots, implementation of artificial intelligence, self-diagnosis, data cloud and circular economy (CE), as well as the production and storage of low-carbon electricity.

Operational objective 1.2: Improving the quality of human capital

The **quality of human capital** is one of the key elements of knowledge-based economy and, at the same time, one of the factors determining the attractiveness of the labour market in the Lodzkie Region. One of the most important factors determining the high level of human capital are **attractive universities**, whose potential is harnessed to the fullest.

In order for these universities to become magnets attracting young people not only from the Lodzkie Region but also other regions and internationally, it is necessary to provide them with comprehensive support, among others by creating a **positive image of the City of Łódź and the Lodzkie Region.** On the other hand, in order to attract scientists from Poland and abroad, emphasis must be placed on the **active promotion and utilisation of the existing technological facilities and human capital,** as well as the **support for implementation doctorates.**

[201] Online sales of products and services to other countries.
[202] Key enabling technologies include micro- and nanoelectronics, photonics, nanotechnology, industrial biotechnologies, advanced manufacturing technologies, among others.
[203] The Industrial Internet of Things is a concept derived from the Internet of Things and includes the industrial application of networked devices, source: przemyslprzyszlosci.gov.pl

Supporting education and increasing the qualifications of the local population is one of the three recommendations formulated in the Analysis of Innovation Diffusion Bottlenecks in the Lodzkie Region.[204]

In view of the growing need for technological development of production and service activities, employers will be looking for employees with a high level of **key competencies** and with qualifications[205] corresponding with the current labour market demand. Particular emphasis will be placed on education from the earliest years aimed not only at theoretical knowledge but also at shaping pro-social and pro-ecological attitudes by incorporating key competences in the learning process. In the light of technological changes occurring in the economy (Industry 4.0, 5G technologies), **digital skills** will become vital in the labour market.

Another element whose development is projected to ensure the growth of human capital quality in the Lodzkie Region is **vocational and basic education**. Promotion of vocational education and more active involvement of entrepreneurs in this process will help generate more interest in such an education model. Shaping the labour market through measures aimed at improving the quality of human capital can be complemented by the **promotion of life-long learning**, primarily for the purpose of helping adults acquire new skills and qualifications convergent with the requirements of modern economy.

The **system of vocational counselling** will be improved, facilitating the acquisition of new qualifications enabling the **inclusion of professionally inactive and unemployed persons in the labour market**. Development of various forms of care for dependent persons, such as: young children, persons with disabilities and seniors, will allow their caregivers to return to the labour market. Another important group of recipients of vocational support are **persons with disabilities**, whose potential will strengthen the labour market. The proposed activities are expected to help bridge the generational gap on the labour market.

Planned measures:

1.2.1. Increasing the use of the potential of higher education institutions in the Lodzkie Region, among others by:

- improving the quality of education at universities, e.g. by enhancing the scientific potential of universities, developing majors correspondent with the needs of entrepreneurs and the labour market, including enterprises in the education process, supporting the development of cooperation networks between universities (including international cooperation), expanding the scope of multidisciplinary curricula,
- creating an attractive image of Łódź and the Lodzkie Region, especially among young people,
- actively promoting and using the existing technological facilities and human capital to attract scientists and researchers from Poland and abroad,
- increasing the level of commercialisation of the research work conducted,
- supporting implementation doctorates.

1.2.2. Popularizing vocational education and lifelong learning, among others by:

- strengthening the potential of vocational education, among others by improving the quality of existing infrastructure and building new facilities, equipping school laboratories and workshops with technical and didactic stations, improving competences and filling staff vacancies, stimulating cooperation between vocational schools and employers, developing vocational training centers and qualifying vocational courses, developing dual, modular[206] and intermediate forms of education,
- developing lifelong learning, among others by expanding the offer of education for working persons, promoting the concept of lifelong learning, developing open-access education, including open online courses (e.g. via educational platforms), development of digital competences among adults,

[204] As per study conducted by Spatial Planning Office of the Lodzkie Region (2020).

[205] Qualification is a set of learning outcomes in terms of knowledge, skills and social competences, acquired in the course of formal education, non-formal education or through informal learning (as per Article 2 of the Integrated Qualification System Act dated 22 December 2015).

[206] Modular education is an educational model dominated by project-based methods (as per https://www.wckp.lodz.pl/content/kszta%C5%82cenie-modu%C5%82owe, accessed on 13 April 2021). Intermediate forms of modular education include modal education, i.e. combining elements of modular and dual education.

- establishing networks of specialist vocational education centers[207] in individual districts, and equipping them with state-of-the-art specialist teaching aids, corresponding to the needs of the economy,
- adapting vocational courses to the requirements of modern economy, regional specialisations, and changes taking place on the labour market, including the development of methods of quantitative and qualitative research matching the school offer to the demands of the labour market,
- engaging employers in the organisation of sector-specific trainings for teachers, study visits of teachers to business entities; developing and implementing a training offer for vocational education teachers,
- promoting vocational education and lifelong learning.

1.2.3. Activating economically inactive people, including the unemployed, among others by:

- developing different forms of care for children up to 3 years of age, family members of persons with disabilities and chronic diseases, and seniors,
- providing access to education/changing the existing qualification criteria for entering vocational education; ensuring the possibility of validation[208] of learning outcomes; strengthening educational and vocational counseling, including for persons with disabilities and young people not in employment or education (NEET group),
- developing supported employment for persons with disabilities,
- increasing the ratio of professionally active reserve labour, including creating quality jobs.

1.2.4. Developing key competencies, among others by:

- improving the innovation of education for the development of creativity, competencies needed in the labour market and pro-social and pro-ecological attitudes, shaped from the earliest age,
- developing business skills at different levels of advancement and intensity for those who want to set up their own business or run business activities,
- strengthening the potential of schools providing general education and pre-school education and other forms of pre-school education, among others through developing and providing an adequate didactic base for educational institutions, equipping schools (e.g. with ICT equipment, natural science laboratories, sports equipment and facilities), enhancing the competences of teachers and teaching staff, developing teaching systems based on computer technologies, integrating children and students with disabilities and special educational needs,
- developing advanced digital competencies relevant to the labour market, among others through the development of curricula for first, second and third degree studies (including the upgrade of faculty competencies), support for postgraduate studies for employees and job-seekers, organizing apprenticeships for students and graduates and trainings for employees and job-seekers,
- increasing the accessibility of infrastructure that simultaneously caters to the educational and promotional needs with the use of multimedia and interactive forms of knowledge popularisation.

Operational objective 1.3: Supporting the development of SMEs

The **sector of small and medium-sized enterprises (SMEs)** constitutes the backbone of the economy of the Lodzkie Region, employing more than a half of its workforce. Companies in the SME sector are more susceptible to economic cycles and less involved in innovation activities. On the other hand, the SME sector is characterized by a high flexibility and effectiveness that results from its uncomplicated structure, and by more personal contacts in business relations.

Actions driving at strengthening the competitive advantages of SMEs and, at the same time, eliminating their development barriers will be vital in the coming perspective. The projected effect of the undertaken activities is an **improved competitiveness of the SME sector,** achieved, among others, by popularizing scientific research and

[207] Specialist vocational training center is a vocational training center specializing in training for particular industries, and providing vocational and lifelong learning services in that regard (as per http://www.zst.augustow.pl/projekty/branzowe-centrum-ksztalcenia-zawodowego, accessed 13 April 2021).

[208] Validation is understood as "checking whether a person applying for a particular qualification has achieved a distinct portion or all of the learning outcomes required for the qualification regardless of the way the person learned" (Article 2 of the Integrated Qualification System Act dated 22 December 2015).

innovations in the sector, supporting technological modernisation and the implementation of the latest solutions in the field of circular economy, including the tools shaping the life cycle of a given product. Also improved will be the **networking of SMEs,** among others through an active search for business partners, including stronger ones with financial resources and technologies, as well as through the establishment of bottom-up territorial network initiatives. The role and involvement of **Business Environment Institutions (BEIs)** in the economy will increase; thanks to an improved offer, strengthened human potential and newly launched financial instruments, BEIs are projected to become a catalyst of growth for the SME sector throughout the region.

Planned measures:

1.3.1. Increasing the competitiveness of enterprises, among others by:

- supporting enterprises that commercialize scientific research, including young, innovative enterprises (startups),
- supporting foreign missions, participating in fairs, promoting businesses in the domestic and foreign markets, and promoting regional products,
- supporting the modernisation of machinery stock and implementation of advanced solutions, including in particular those which are in line with the smart specialisations of the Lodzkie Region,
- supporting the digitalisation of enterprises, implementation of Industry 4.0 solutions and data-based economy, and the development of digital competences of employees working in SMEs,
- creating a system of support for newly established entities that will co-finance their operation in the first period of their functioning, provide them with training and advisory support, and co-finance innovative solutions and those in the field of circular economy,
- supporting R&D undertakings in the SME sector, among others through financial instruments,
- supporting the implementation of new business models and modern and sustainable solutions among SME, also in the field of circular economy, e.g. by adopting the product life cycle analysis methodology,
- promoting corporate social responsibility,
- using the potential of silver economy to develop technologies, products and services for seniors,
- supporting the creation of new development areas, including, among others, the preparation of technical infrastructure in the investment areas and the promotion of investment areas.

1.3.2. Supporting the networking of SMEs, among others by:

- supporting enterprises in entering international economic chains, e.g. through training, participation in study visits, industry events and seminars,
- supporting territorial networking initiatives, including intersectoral cooperation within clusters, among others by providing platforms for discussion and cooperation for entrepreneurs and stimulating the development of networking by regional authorities,
- supporting the cooperation of enterprises in creating interdisciplinary solutions.

1.3.3. Improving the effectiveness and efficiency of BEI operations, among others by:

- expanding the catalogue of services and strengthening the competence of BEI employees,
- increasing the number and value of loan institutions, seed capital and venture capital,
- increasing the efficiency of BEIs as operators of training and advisory and implementation services fostering the development of the SME sector,
- supporting the operations of technology parks, business incubators and technology transfer centers,
- strengthening the cooperation of BEIs and public administration entities within systems of entrepreneurial development.

Operational objective 1.4: Developing the agricultural sector and increasing its competitiveness

An important economic sector in the Lodzkie Region is the **agricultural sector**, with the key role in its development played by individual farmers, including those who operate **family-owned farms**. In order to increase the use of raw material and processing potential, and to strengthen the competitive position of agriculture in national and international systems, it will be necessary to take actions aimed at improving the territorial structure

of farms and the technological modernisation of agriculture, along with enhancing the scale of cooperation and innovation. Also important will be the activities that seek to improve the offer of quality products yielded from local farms, as well as their promotion, along with the creation of new organisational and marketing models and new forms of grassroots community initiatives. This will allow the region to achieve synergy effects and **strengthen the position of farmers** in the food chain. At the same time, emphasizing sustainable agri-food processing and high quality food production will enhance **food safety** and help cater to the current consumer tastes and demands, both domestically and internationally. Another important challenge will be the reduction of food losses and waste, along with improved management of the food chain in line with the principles of circular economy.

Planned measures:

1.4.1. Increasing the efficiency and profitability of agricultural production, among others by:

- modernizing and restructuring agricultural holdings, including family agricultural holdings, among others by means of improving the territorial structure (land consolidation), supporting specialisation in agricultural production, supporting mechanisation and automation in holdings, promoting computer-based farm management, and implementing the precision farming model,
- improving farming efficiency (e.g. changes in production technology based on the use of data - Internet of Things, implementation of technical progress) and adapting to the changing market conditions as well as implementing the idea of circular economy, including the use of agricultural waste and waste and residues from the food sector,
- strengthening horizontal and vertical integration processes on the agricultural market, including through the development of cooperation between producers, facilitation of farmers' organisation into agricultural co-ops, strengthening the links between farms and agri-food processing plants, shortening supply chains,
- supporting innovation in agricultural and rural areas, including the enhancement of knowledge transfer and improvement of knowledge transfers between research and practice,
- supporting measures aimed at the production of innovative machinery and equipment and services for agriculture.

1.4.2. Maintaining a high level of quality of agri-food products, among others by:

- supporting the establishment of ecological farms and producers of high quality food: ecological, traditional, regional,
- supporting the construction and modernisation of local agri-food markets and market places, supporting short supply chains,[209] including within the framework of innovative organisational and marketing solutions (franchise model), increasing the position of agricultural producers in their relations with recipients, and boosting the supply of high quality food,
- promoting and supporting the distribution of local and traditional products,
- supporting the creation of a sustainable and competitive agri-food industry.

2. SOCIAL SPHERE - STRATEGIC GOAL: CIVIC SOCIETY OF EQUAL OPPORTUNITIES

The Lodzkie Region is currently faced with a number of challenges, among others **social cohesion**, including the **growth of social capital, strengthening of the function and role of the family, improvement of population health**, and **mitigating the scale of poverty and social exclusion.**

Creating equal development opportunities, especially for the weakest stakeholders, along **with adequate access to social infrastructure and public services** is projected to help build a civic society of equal opportunities. Special support will be provided to **senior residents**, both those with limited independence and those who need to be activated in various ways.

Achieving the aforementioned objective will require actions in several areas. Particularly important, especially in the context of the worsening demographic situation in the region, will be the activities seeking to **improve the**

[209] A short supply chain means reducing the number of intermediaries required to deliver the final product to the final consumer.

health situation of the region's population, both through preventive measures and the development of medical services and infrastructure.

Another group of activities will be undertaken in the area of **integration and countering social exclusion**, with a view to creating equal development opportunities for the Lodzkie Region residents and the social inclusion of the excluded, or those at risk of exclusion.

In the field of social policy, the undertaken activities will be addressed in particular to people and families struggling with social adversities and poor living conditions, which they are not able to overcome using their own resources and capabilities.

Utmost importance will also be paid to activities contributing to the **development of social capital**, e.g. raising social awareness (including environmental awareness), increasing the level of social trust, the sense of regional and local identity, and involvement of the residents of the region in social, charitable, and cultural activities.

A key role in this regard will be played by the **cultural sector**, which is projected to create new opportunities for the development and availability of the cultural offer, including in the digital space.

A detailed delineation of the objectives in the social sphere will be featured in the Regional Strategy for Social Policy 2030,[210] which constitutes an integral part of the Development Strategy of the Lodzkie Region 2030, and in programs for the support of families and the foster care system.[211]

Operational objective 2.1: Developing social capital

Social capital or, more specifically, its high quality, determines the proper functioning of civic societies of equal opportunities. Social capital is also an important factor of economic development, and its insufficient level constitutes one of the barriers to business cooperation and innovation diffusion. Improving the quality of social capital will require measures on a number of levels. Their effect will be, among others, an increase in the level of trust of the Lodzkie Region residents towards one another and towards the representatives of public authorities. This will translate into improved cooperation and greater efficiency of the efforts for socio-economic development at the local and regional level. An increase in mutual trust among entrepreneurs will be conducive to the development of cooperation networks (especially among SMEs), and the establishment of cluster initiatives.

Raising social awareness in terms of pro-health, pro-ecological and pro-innovation behaviors will be correlated with the development of civic society. This will be achieved by shaping attitudes and behavioral patterns, promoting family values, learning to cooperate from an early age, and through the dissemination of civic participation mechanisms. The growth of social capital translates into raising social awareness, which consists, among other things, in making the region's residents sensitive to others, but also to crisis situations and appropriate responses in case of their occurrence.

An important component of social capital is **family capital**, understood as family ties between: spouses, parents and children, grandparents and grandchildren, and siblings. The quality of life, a sense of happiness and security depend on family ties. It is an important factor, because it is in the family that a person can satisfy their basic need for affection, which translates into his/her attitude and activity in various (social, cultural, and economic) spheres.[212]

Building social capital will also be fostered by the **activities of non-governmental organisations**. Supporting the third sector and promoting volunteerism will affect the growth of social involvement. One of the forms of activating local communities will be the activities of Voluntary Fire Brigades and Rural Housewives' Clubs, founded on regional knowledge and cultivating traditions.

Cultural activities are projected to exert significant influence on the development of social capital. Thanks to modernisation and expansion of activities undertaken by cultural institutions (theaters, museums, cultural

[210] The Regional Strategy for Social Policy 2030 is scheduled for adoption in the 1st quarter of 2021. It indicates 8 thematic areas related to the support of families and foster care; poverty and homelessness; energy poverty; aging society; disability and dependence; social economy; migration; risky behaviors and addictions.

[211] See the Family Support and Foster Care System Act dated 9 June 2011 (Journal of Laws of 2019, item 1111, as amended).

[212] Sztaudynger J. J., Rodzinny kapitał społeczny a wzrost gospodarczy w Polsce [in:] Annales. Etyka w życiu gospodarczym, 12/1., Wydawnictwo Uniwersytetu Łódzkiego.

centers, libraries) and NGOs, participation of residents in cultural events and initiatives is expected to increase. Organisation of cultural events will create space for exploration and inspiration, along with meeting places for families and different age and professional groups, while also helping to integrate local communities. In this context, it will be very important to develop cooperation between cultural institutions and entities conducting cultural activities in the field, as well as to support creators and animators of culture. Greater use of digital technologies will make it possible to disseminate culture online, increase the competences of cultural personnel, and publicize the cultural offer. Cultural education, especially of children and young people, will also play a key role in fostering creative attitudes.

The **development of sports and tourism infrastructure** will provide a basis for the dissemination of physical activity among the residence of the Lodzkie Region, while also ensuring an important impulse for creating image-building tourism products and boosting the regional leisure industry. An attractive offer, promoted with the use of modern ICT tools, will contribute to creating a tourist brand of the Lodzkie Region. On top of that, broad participation of residents in various forms of **tourism, sports and recreation** will contribute to establishing social ties at the local level, while also enabling families to actively spend their free time together.

Learning about one's own **cultural heritage**, respecting traditions, supporting folk culture, popularizing the knowledge of the region and its history (especially among children and youth), is expected to build lasting bonds with the region and the local community, which will translate into a greater sense of solidarity among individuals or different micro-communities, as well as an increased sense of joint responsibility for the shared resources and public goods.

Planned measures:

2.1.1. Building social trust, developing social and civic awareness, promoting family values, among others by:

- supporting trainings, educational programs and competitions promoting pro-citizen, pro-social and pro-environmental attitudes, among others by shaping cooperation skills, building openness to others, supporting raising competence of social leaders, training volunteers,
- fostering grassroots initiatives, including projects under the civic budget, the LEADER program, regional micro-grant program and village funds,
- strengthening the institution of family and marriage, building intergenerational ties,
- creating and strengthening a positive image of the NGO sector; stimulating cooperation between NGOs, private and public sectors; developing the competences of NGO personnel; promoting and supporting NGO volunteerism,
- developing various forms of institutional support for the civil sector, e.g. support centers, NGO incubators.

2.1.2. Increasing cultural participation and developing cultural services, among others by:

- strengthening the potential of regional and local cultural institutions and other entities operating in the sector, among others by investing in improving the quality of the existing and building new cultural infrastructure, as well as equipping it with facilities required e.g. for the implementation and development of e-culture,
- supporting staff development in cultural institutions, including culture animators,
- increasing the attractiveness of cultural offer adapted to the changing needs of recipients and all age groups, among others through the use of digital technologies (e-culture),
- developing cooperation between cultural institutions and entities conducting cultural activity in the field,
- animating cultural potential in local communities, including peripheral areas, e.g. through social initiatives conducive to the inter-generational exchange of cultural values,
- developing cultural education programs to improve the cultural and artistic competences of the region's inhabitants.

2.1.3. Developing the sports, tourism and recreation sector, among others by:

- fostering investments in sports, recreation and tourism infrastructure (including e.g. tourist trails, cycling routes, educational and tourist centers, facilities providing hotel services, agrotourism and ecotourism, catering facilities), and developing public spaces conducive to physical activity, recreation and family leisure,
- improving the attractiveness of tourist, recreational and sports offer adapted to the needs of all age groups and persons with disabilities, including, among others, the development and commercialisation of tourist products and leisure industry,
- using modern information and communication technologies (ICT) for the promotion of tourist offer and services related to leisure (e.g. integrated information system, e-tourism),
- popularizing physical activity among the region's residents (including the elderly, persons with disabilities, children and the youth),
- supporting the organisation of sports and tourist events.

2.1.4. Strengthening regional and local identity, among others by:

- shaping regional and local awareness based on historical and cultural diversity, among others by supporting the organisation of exhibitions, events and competitions promoting the region,
- supporting regional traditional products and the development of folk art, including, among others, the use of forms of tradition in the sector of creative industries, building the infrastructure of regional centers for the promotion of traditional products and folk art,
- creating and developing the "Łódzkie" brand to better utilize the potential of cultural heritage, space advantages, products and symbolic events,
- disseminating knowledge about the history and tradition of the region at all levels of school and non-school education.

Operational objective 2.2: Improving population health

Health is one of the factors determining the quality of human capital and an indispensable condition for maintaining professional and social activity and high quality of life. It is therefore necessary to take a number of actions in the area of **prevention, improvement of quality and accessibility to healthcare services** (including the development of eHealth) and **development of long-term care and psychiatric care**. The adopted measures are projected to contribute to the improvement of the quality of human capital and extension of the life expectancy of women and men.

Physical activity, avoiding smoking and limiting alcohol consumption, together with a proper diet are the bases of a healthy lifestyle. By positively affecting the human body, movement influences the proper psychophysical and health condition of a human being. Therefore, it will be necessary to **increase health awareness** as well as to promote an active and healthy lifestyle among the residents of the Lodzkie Region, e.g. through the Healthy and Active Senior Centers. **Disease prevention and screening tests will contribute** to early detection and treatment of diseases, including those characteristic for old age, as well as reducing the rate of disability and unfavorable social behavior patterns. On the other hand, early diagnostics will contribute to faster conservative treatment. It will also be extremely important to implement **health programs** that will reduce the number of deaths in the future (e.g., free HPV vaccinations, pneumococcal shots, influenza and COVID-19 vaccinations).

Due to unequal access to medical services in the Lodzkie Region, it will be necessary to **further develop healthcare infrastructure** and support the **education of medical staff,** while also increasing the number of medical personnel. It will also be essential for the region to **improve the availability and quality of healthcare services** which have a decisive impact on the health and life of its residents (cardiovascular diseases, cancer, neurological diseases of old age). The growing process of aging of the population will require the **development and use of innovative technologies** in healthcare (including telemedicine, telecare).

Significant influence on the condition of healthcare related to the emergence of the COVID-19 pandemic will have solutions in the field of e-services in medicine. IT support directed at modern medical technologies (equipment, apparatus) will be necessary, as well as appropriate protection of medical services and hospitals.

Besides, psychiatric and psychological support will be required for children and adolescents who have suffered from isolation related to the coronavirus pandemic (remote learning).

Coordinated healthcare is projected to translate into an improved level of health security of patients and the quality of life of the chronically and terminally ill. In view of the progressing process of aging of the society, activities related to the development of services in the scope of **long-term care, hospice and geriatric care** will become a priority. Due to a considerable deficit in that scope, it will be important both to increase the number of inpatient beds in long-term care, hospice and geriatric care and improve **long-term community care**. Development of human resources, including **geriatricians**, will translate into more effective and efficient treatment of the elderly.

Dissemination of the **community model of psychiatric healthcare** (among others through creation of mental health centers) will contribute to providing comprehensive and universally available healthcare to persons with mental disorders.

Planned measures:

2.2.1. Increasing health awareness and strengthening prevention efforts, among others by:

- promoting active and healthy lifestyle, including through health education, improvement and development of sports and recreation infrastructure, and development of open activity zones
- promoting preventive programs and expanding their offer to include new programs that have not been financed from public sources to date, including the introduction of free preventive vaccinations for persons with the lowest immunity and those most vulnerable health-wise (the elderly, people suffering from multiple diseases),
- developing diagnostic activities in the area of the most common diseases in the region,
- supporting educational programs promoting fruit and vegetable consumption as a recommended eating style in the prevention of diet-related diseases.

2.2.2. Improving the accessibility and quality of healthcare services, among others by:

- improving access to healthcare services adequate to the demographic and epidemiological situation, including the development of outpatient specialist care, coordinated healthcare and popularisation of the use of modern technologies and digital solutions, e.g. telecare and telemedicine, especially for the elderly living in remote rural areas,
- developing healthcare infrastructure, including the infrastructure of observation- and infectious diseases wards and emergency backup infrastructure ready to be activated e.g. in the case of a pandemic,
- supporting education and professional development of medical personnel and counteracting shortages of medical personnel,
- popularizing the coordination of health and social care.

2.2.3. Improving the accessibility of long-term and psychiatric care, among others by:

- supporting the development of facilities and upgrading the skills of long-term care personnel,[213]
- improving the quality and availability of community-based long-term care, including home nursing care and medical day care facilities,
- improving access to inpatient forms of geriatric, palliative and hospice care,
- disseminating the community model of psychiatric healthcare, e.g., within mental health centers,
- improving access to qualified psychiatric and psychological care services and programs for children and the youth.

[213] **Long-term care** (as defined by the **Ministry of Health**) refers to long-term, professional nursing and rehabilitation and continuation of pharmacological treatment and dietary management in the home environment. **Long-term nursing care** is provided at the patient's home.

Operational objective 2.3: Reducing poverty and social exclusion

Building **social cohesion** requires a number of measures aimed at **reducing the scale of poverty and social exclusion** of **disadvantaged families and persons**, who are unable to improve their situation without adequate support. Reducing social inequalities and social integration of families and persons at risk of marginalisation also positively influences the economy through the social and professional activation of excluded persons. In this context, measures should be undertaken aimed at supporting active social inclusion, improvement of **living standards** in dwellings deprived of basic utilities (toilet, bathroom, central heating), among others through comprehensive revitalisation and reduction of **energy poverty**. Other dimensions of exclusion, limiting full participation in social and economic life and requiring intervention, include **transport exclusion** (which concerns especially peripheral areas of the region) and **digital exclusion**, which primarily affects senior residents. Also important in this respect will be actions facilitating the provision of basic housing needs, especially to low-income groups.

Demographic changes and the aging of society generate a demand for specific social services, including services related to anti-aging medicine, and especially care services for persons with disabilities, the elderly, and people in need of assistance in everyday life. Preference will be given to social services provided in **deinstitutionalized forms** by the local environment in the place of residence of these persons, also in the form of **support centers** (including community self-help homes, day care facilities and seniors' clubs) and **sheltered and supported apartments**. This will allow to prolong the stay of persons in need of daily assistance and persons with disabilities in their home environment, which will strengthen their **sense of dignity and empowerment**. These actions will also help relieve their families, thus enabling caregivers to seek employment while also improving the quality of home care provided to dependent persons. The **process of deinstitutionalisation** of services is most advanced in the area of childcare, where **family foster care** is promoted instead of childcare institutions, and this direction will be continued. Families will also be supported in order to strengthen their caring and upbringing functions. One crucial objective will be the **improvement of accessibility of public spaces** for persons with special needs and limited independence, including persons with disabilities and the elderly, which will be conducted in accordance with the principles of universal design.

It will also be necessary to undertake effective actions aimed at **helping the social transition of people affected by homelessness and addiction**, and empower them towards social reintegration. **Social innovations**, such as **care farms** or **multi-generational homes**, should also serve to solve social problems of the inhabitants. An important role in supporting social and professional integration of the poor and vulnerable to social exclusion, among others degraded and revitalized areas, should be played by **social economy entities and non-governmental organisations and Local Action Groups**. Development of **social and solidarity economy** will contribute to increasing the role of those sectors in the economy, and to solving social problems.

Planned measures:

2.3.1. Supporting families and individuals at risk of poverty and exclusion, among others by:

- developing family support system in the community, including through increased supply of services for families, e.g. early comprehensive support of children development, specialist counselling, day care centers for children and the youth,
- developing various forms of support for individuals and families at risk of energy poverty and living in substandard dwellings,[214] including those located in rural areas and in old tenement houses in cities (among others through their comprehensive revitalisation),
- undertakings aimed at limiting the scale of transport exclusion, especially of persons living in peripheral communes, and the scale of digital exclusion, especially among seniors,
- creating conditions for social inclusion of persons in need of support in daily living and persons with disabilities, among others by improving access to therapy and rehabilitation and jobs adapted to their abilities,

[214] Substandard dwelling is a dwelling in poor technical condition, with no toilet, bathroom, or central heating.

- supporting activities aimed at satisfying basic housing needs of families with low and average income and persons at risk of poverty and social exclusion,
- developing various forms of assistance and support for people particularly at risk of exclusion, including: the homeless (e.g. night shelters, shelters, heating), addicts (e.g. prevention, therapy, rehabilitation).

2.3.2. Developing facilities and services provided by local communities (deinstitutionalisation of services), among others by:

- developing and popularizing community-based care services, including support for caregivers of persons with limited independence, such as the elderly, persons with chronic diseases, dementia and mental illnesses (e.g. day care, home care, respite care, training, medical equipment rentals),
- developing day care centers (including community self-help homes, day care centers) and assisted and sheltered housing, as well as assistance services for persons with disabilities,
- developing social innovations (e.g. multi-generational houses, care farms),
- popularizing long-term care in care-friendly institutions (e.g., family care homes, intimate care homes),
- supporting activities aimed at adaptation of public spaces; ensuring architectural, digital and ICT accessibility for persons with special needs, including persons with disabilities and the elderly; taking into account universal design or application of reasonable upgrades,
- developing and supporting the foster care system, among others through the promotion and implementation of new solutions and creation of foster care infrastructure.

2.3.3. Developing social and solidarity economy, among others by:

- increasing the market competitiveness of social enterprises and social economy entities, among others by supporting partnerships of social economy entities and local governments in delivering social services, and establishing cooperation of these entities with the business sector, as well as providing counselling support for the sector of social economy entities,
- developing social and professional reintegration entities, including: Social Integration Centers, Social Integration Clubs, Occupational Therapy Workshops, Occupational Activity Works,
- engaging social and solidarity economy entities in solving social problems on degraded and revitalized areas; supporting employment of persons at risk of exclusion.

3. SPATIAL SPHERE - STRATEGIC OBJECTIVE: ATTRACTIVE AND ACCESSIBLE SPACE

One of the strategic ambitions in the spatial sphere is to create appropriate conditions for the development of the region through the creation of attractive and accessible space, which will promote economic development and improve the quality of life of the region's residents, while also respecting environmental resources. The actions taken will require a systemic approach to the issues related to, among others, **climate change adaptation, improvement of the quality of the environment**, and the protection and shaping of **landscape**. An equally important aspect will be to create effective infrastructural networks by increasing **transport and ICT accessibility**, ensuring energy security and rational waste management.

Achieving the strategic objective based on the defined challenges will require a wide range of strategic actions implemented on condition of limited interference in environmentally valuable areas, in particular Natura 2000 areas. In the face of intensifying climate change, it is essential to eliminate **air pollution**, especially in cities, improve **water quality** and forest health, as well as counter the effects of droughts and extreme weather phenomena. Another crucial issue is the protection of **cultural heritage**, especially post-industrial, multicultural and film heritage, as well as **natural values**, while maintaining a harmonious landscape. The transport system will be an area requiring special support. In order to increase accessibility, activities consisting in complementing the **strategic road system** and inclusion of the region in the system of **high-speed railway connections**, especially within the TEN-T network strengthening international and interregional connections and the bipolar system of the

metropolitan areas of Warsaw and Łódź, and ensuring aerial services in the region, will be of key importance. In order to achieve a modal shift towards more **sustainable forms of transport**, it will be paramount to create an attractive and competitive public transport offer, including the implementation of fully integrated and passenger-friendly transfer hubs and increasing the **intermodality of freight transport**. In addition, the projected activities will focus on creating appropriate investment conditions for the development of logistics services, conducive to the formation of a logistic hub of European stature.

Another challenge will involve carrying out energy system transformations supporting the region's transition to a climate-neutral economy, including a significant increase in the share of energy from renewable sources.

On top of the above, **waste management will be rationalized** in order to reduce the negative impact on the environment and foster a circular economy. The last pillar of building modern infrastructure will involve the improvement of **accessibility of ICT services** based on both wired and wireless networks.

Operational objective 3.1: Adapting to climate change and improving the quality of environmental resources

Climate change and more frequent occurrence of extreme events in the recent years have become a clear factor in reducing the quality of life. Human activity exerts pressure on all elements of the environment, affecting the deterioration of air quality, especially in urban areas, and contributing to water pollution, water deficits and intensification of drought effects, which in the long term are projected to increase the risk of droughts and reduce the disposable resources of surface and underground waters. Therefore, it is important to take actions mitigating the negative changes in the environment, including among others countering drought effects and implementing effective flood risk management.

Air quality will be improved by the **development of infrastructural heating systems**, which will help reduce surface emissions, and by the **development of low- and zero-emission transport**, which will lead to the reduction of linear emissions (a problem tied to well-developed road transport) and the backwardness in transforming the transport policy model. In addition, the formation of aeration corridors in urban areas will support the maintenance of favorable aero-sanitary conditions. In order to **improve the quality of waters**, it will be necessary to intensify the implementation of sewage systems and the renewal and restoration of the natural character of rivers, prevention of further degradation of retention reservoirs (including among others the Sulejów Reservoir), as well as activities helping to fulfil the adopted environmental objectives, especially for surface water bodies, by limiting the inflow of pollutants from various sources. These measures are projected to improve the quality of surface waters and restore most of them to the desired ecological status/potential and chemical status.

Counteracting the effects of drought in the Lodzkie Region will involve the implementation of solutions aimed at improving the retention capacity of drainage basins, which will continually reduce water shortages. The scope of these activities will include increasing the quantity and quality of disposable water resources in the landscape while protecting biodiversity, building retention facilities, increasing or reconstructing natural retention (including wetlands and oxbow lakes) and valley/corridor retention, developing drainage systems and increasing the amount of organic matter in the soil. Intervention in this area will lead to increased water retention, minimizing the impact of drought on the environment and maintaining the food-producing function. Groundwater resources will also be protected through the modernisation and replacement of networks in water supply systems. One problem that calls for an urgent solution is increasing the region's resistance to the occurrence of heavy rains and sudden floods,[215] especially in urban areas, e.g. through construction and development of drainage systems, with particular consideration of solutions involving water reuse (e.g. retention). **Limiting the effects of extreme phenomena** requires investments to minimize the effects of natural disasters (e.g. floods, storms, heat).

Planned measures:

3.1.1. Improving air quality, among others by:

[215] See the City of Łódź Climate Change Adaptation Plan to 2030.

- reducing surface emissions, including thermal upgrading; replacing current heat sources with environmentally friendly substitutes (e.g. RES, heat pumps), supporting passive and energy-efficient construction; constructing, expanding and modernizing heating systems (e.g. cogeneration and trigeneration) and gas distribution systems (including the development of LNG),
- reducing emissions from linear sources, including among others the development of a coherent system of cycling routes (including regional, supra-regional and international ones) together with the infrastructure and public bicycle schemes;[216] implementation of organisational solutions fostering the development of sustainable transport; promotion of eco-mobility and development of modern forms of travelling; construction of power supply systems for zero- and low-emission vehicles,
- maintaining and creating air corridors, introducing trees and bushes along streets and in public squares, afforesting wastelands.

3.1.2. Protecting water resources and improving their quality, among others by:

- developing water supply and sewage systems, including (among others) the expansion and modernisation of potable water intakes and treatment facilities as well as the water supply network; expansion of sewage treatment plants and sewage systems in sewage agglomerations included in KPOŚK (National Program for Municipal Waste Water Treatment), in order to fully service the residents living within this network; construction and expansion of sewage systems and sewage treatment plants in urban and rural areas outside sewage agglomerations; implementation of an intelligent management system for the water supply and sewage network,
- reducing the rate of eutrophication of surface waters, including (among others) the protection, improvement and prevention of deterioration of the ecological condition/potential and chemical condition of surface water bodies, cessation and gradual elimination of pollutant emissions to surface waters (priority substances, substances particularly hazardous to the aquatic environment), among others by using individual systems of collection and disposal of wastewater including household sewage treatment plants in dispersed areas; renaturalisation of rivers and water reservoirs; implementation of good agricultural practices minimizing the production of pollutants with the use of biotechnological and ecohydrological solutions; creation of highly efficient ecotone zones in river systems and retention reservoirs.

3.1.3. Countering the effects of drought and decreasing water scarcity, among others by:

- improving retention capacity, including the improvement in natural retention and restoration of natural flow conditions through afforestation; limiting the use of forest land for non-forest purposes; applying solutions to mitigate water run-offs; protecting spring areas, wetlands, water reservoirs; restoring and protecting wetlands and old river beds; construction of small and medium-sized water retention facilities (including multi-functional retention reservoirs); reconstruction of river valley/river bed retention capacity; on-site management of rainwater; construction and development of drainage systems with particular emphasis on water reuse solutions,
- conducting rational agricultural management, including the implementation of the latest agrotechnical technologies, using more drought-resistant crops; converting drainage systems into drainage-irrigation systems, including small retention systems; reconstructions of damming facilities;[217] preservation of permanent grassland and cultivation of catch crops; maintaining the existing and creating new biodiversity refuges (e.g. baulks, orchards with traditional varieties of fruit trees); using the Internet of Things for the aforementioned purposes; reducing greenhouse gas emissions from agricultural sources.

3.1.4. Mitigating the effects of extreme weather phenomena, among others by:

- developing anti-hazard infrastructure, including (among others) the construction and modernisation of stormwater drainage systems (along with increasing underground retention), communication and early warning monitoring systems (including aviation),

[216] Public bicycle schemes complement the systems of public transport.
[217] Among others those submitted by the Marshal of the Lodzkie Region as part of the Plan for Countering the Effects of Drought.

- providing equipment to services removing the effects of extreme events, e.g. snowfalls, storms, floods, fires,
- implementing flood prevention investments, among others the construction and modernisation of hydrotechnical facilities, including multifunctional retention reservoirs[218] and other water equipment, ecological flood protection, expansion of flood storage facilities, rational management of flood risk areas,
- implementing fire-fighting investments, among others the construction and modernisation of observation facilities, fire access roads and water intake points, and construction of retention reservoirs with fire-fighting functions.

Operational objective 3.2: Protecting and shaping landscape

Anthropogenic environmental changes, including urbanisation pressure, pose a threat to the cultural and natural landscape. The essence of effective protection and proper shaping of space lies in the preservation of links between natural, landscape and cultural values. Maintaining the value of cultural landscape will require a number of protective measures, especially with respect to preserving the **completeness and integrity of the protected assets**. In relation to degraded cultural heritage, it will be crucial to **implement revitalisation processes** aimed at restoring utility functions, including cultural, tourist, and recreational functions. With regard to the restoration of urban space, introducing green areas in urban space will play a key role.

With respect to protection of natural and scenic values, the most important activity involved in ensuring the achievement of the adopted objective will be the enlargement and **cohesion of the regional system of protected areas**, which will ensure its connection with the national and international system, while also, to some extent, limiting the urbanisation pressure. Also important will be activities conducive to the protection, enrichment and restoration of biodiversity, which will minimize the risk of degradation of areas of significant natural and scenic values.

Preservation and improvement of the quality of natural and landscape resources are the basic factors affecting the tourist attractiveness of the Lodzkie Region**. Rational use of natural and landscape assets** for sustainable tourism and recreation will be important in shaping the tourist brand of the region. The health tourism industry will also continue to be developed (including spa and rehabilitation tourism) using the potential of thermal and therapeutic water resources. The creation of a regional system of protected areas will not hinder the creation of sustainable tourist routes and trails with the necessary tourist and recreational infrastructure. At the same time, raising the standards of tourist, sports and recreation infrastructure will positively influence the development of the so-called "leisure industry" addressed to all age groups.

In terms of landscape-shaping and increasing natural potential, one of the important activities will involve **arranging green areas of high utilitarian, aesthetic, and educational values**. Introduction of greenery will play an important role in spatial revalorisation, especially in urban environment, while also improving adaptation to climate changes in densely developed areas. Multifunctional gardens and parks will become attractive places for families and active recreation, and the introduction of blue-green infrastructure elements, including green enclaves (green backyards and front gardens, community gardens, green roofs and walls, and green bus stops) will contribute to the creation of aesthetic and friendly space. An important priority in terms of shaping green areas will be the establishment of Green Networks.

A responsible and **sustainable approach towards shaping space** in ways that recognize the value of cultural and natural heritage and place emphasis on such factors as the minimisation of negative human interference in the landscape, limiting and eliminating urbanisation and growing spatial chaos, will determine the quality of

[218] These include, among others, investments resulting from the premises of the Program for Counteracting Water Scarcity for 2021-2027 with the perspective to 2030 (Official Gazette of the Republic of Poland dated 4 October 2019, item 941) and the draft Plan for Counteracting the Effects of Drought.

landscape, and thus the quality of human life. Landscape attractiveness and the quality of the natural environment will co-determine the market value of space, real estate, and national assets in the long run.

Planned measures:

3.2.1. Protecting and shaping the value of cultural heritage, among others by:

- preserving the completeness and integrity of cultural heritage as a factor defining the cultural landscape and regional identity, including in particular historical monuments, representative monuments,[219] historical urban and architectural complexes, and unique components of cultural heritage, related to post-industrial landscape, transport,[220] religious heritage, residential complexes,[221] film-making traditions, national minorities, and wooden architecture,
- using the potential of heritage for utilitarian (including commercial) and promotional purposes (restoration of degraded areas and development of endangered and abandoned sites for cultural, scientific, educational, tourist and recreational functions, ensuring proper conditions for the preservation of particularly unique components), accounting for local natural and landscape specificity,
- increasing the scale and effectiveness of the protection of cultural resources, including support for the restoration of historic buildings, expansion of financing opportunities, support for alternative forms of financing cultural heritage, such as crowdfunding,
- inventorying and promotion of local architectural forms, promoting knowledge about architecture, compiling catalogues of design patterns in modern architecture (in accordance with local traditions) embedded in local landscapes.

3.2.2. Protecting and using natural and landscape assets, among others by:

- creating a coherent regional system of protected areas, maintaining protection of its existing elements, verifying protected landscape areas with disorderly legal status and establishing new ones and increasing the area of areas under legal protection,
- counteracting and eliminating the processes of uncontrolled suburbanisation and progressing spatial chaos,
- protecting, enriching, restoring and monitoring biodiversity, maintaining the existing forms of nature protection outside the system of protected areas and establishing new ones, maintaining and shaping the sanctuaries of the highest biodiversity, renaturalizing degraded ecosystems, restoring endangered plant and animal species, controlling and limiting the expansion of invasive species, creating a comprehensive landscape monitoring,
- using natural and landscape values for sustainable tourism, taking into account active, cognitive, ecological, educational, family, and health-related tourism (including spa and rehabilitation tourism).

3.2.3. Revitalisation, enlargement and enrichment of space with attractively arranged green areas, among others such as:

- recreational and sports gardens (including such facilities as playgrounds, sports fields, small local stadiums, mini amphitheaters, outdoor gyms, tennis courts, skate parks, swimming pools, ski slopes and ice rinks),
- fruit gardens (e.g. orchards with traditional varieties of fruit trees, vineyards),
- educational gardens (e.g. botanical gardens, arboretums, thematic gardens, historical gardens, popular science gardens, sensory gardens, zoological gardens),
- historic forms of greenery (e.g. at residences and sacral buildings),
- green enclaves (e.g. green backyards and front gardens, community gardens, flower meadows, “pocket” parks, “green roofs,” “green stops,” “green walls”) together with elements complementing green areas (e.g. apiaries on roofs, birdhouses),
- Green Networks understood as networks of gardens with different functions connected by bike paths, footpaths enriched with tourist infrastructure, e.g. tourist shelters and viewpoints.

[219] According to the list included in the current Lodzkie Region Monuments Care Program for 2020-2023 and its subsequent editions.
[220] Elements of historic transport infrastructure (railways, streetcars, roads) include line and point infrastructure, including narrow-gauge railways, bridges, stations.
[221] Palaces, manor and park complexes.

Operational objective 3.3: Increased transport accessibility

The **development and completion of the Lodzkie Region strategic transport system**, particularly within the framework of the trans-European transport network TEN-T, is one of the key challenges that increase the region's attractiveness and accessibility, contribute to strengthening interregional connections, and allow taking full advantage of the region's location in Poland and Europe. The essence of a well-functioning transport system that meets the most important challenges and fosters the region's growth is a well-developed**, integrated, modern transport infrastructure,** supported by adequate organisational measures and efficiently managed.

The key aspect of an efficient transport system, enabling the achievement of the adopted objective, will be to **increase road accessibility**, among others by complementing the Lodzkie Region strategic road system and discounting its routing by providing efficient connections with nodes, implementing new road nodes and bypasses, as well as raising the technical standards of public roads. This will allow the region to be included in the system of national and European connections (especially in the context of the Solidarity Transport Hub), while also strengthening internal cohesion and ensuring comfortable travel, improved safety and traffic fluidity. Another key element for the implementation of the objective will be the **inclusion of the region in the system of high-speed rail connections and increasing its** railway **accessibility**. This will be achieved through investments in the expansion of the railway system and infrastructure, including the implementation of a system of **routes**[222] **offering access to the Solidarity Transport Hub**, e.g. the **High-Speed Railway (HSR),**[223] which will also conduct fast regional traffic. The development and improvement of infrastructure quality and elimination of bottlenecks, among others the improvement of railway junctions (e.g. the Łódź railway junction), as well as the inclusion of narrow-gauge railway lines in service in the areas excluded from the transport network, and the expansion of the passenger offer along the routes dominated by freight traffic, will create a viable substitute for individual motor transport and contribute to an increase in the share of railway in passenger transport, both in national and regional journeys.[224] Given the projected continuous growth of demand for passenger air transport, after the end of the COVID-19 pandemic it will be crucial to take measures to **increase the aerial accessibility of the region**. Particularly important in the context of intercontinental connections will be the air hub at the Solidarity Transport Hub. Until its launching, air services for the region will be provided by PL Łódź, which, after the implementation of the STH, will play a reserve role in terms of domestic, charter and business flights.

The transport system should be developed in a more **sustainable and environmentally friendly** direction with the simultaneous use of modern technologies increasing its efficiency and a **modal shift** towards the development of modern, integrated and environmentally friendly means of transportation. Therefore, it will be important to **create an attractive and competitive public transport offer**, which will feature investments improving the quality of infrastructure, including integrated transfer hubs, as well as line and point infrastructure. In addition, investments in modern fleet and rolling stock (buses, streetcars, trains) that take into account the needs of disabled persons and persons with limited mobility will be crucial in order to encourage travelers to use public transport.

It is assumed that, among others, the expansion of the railway system, including terminal lines, the development of intermodal terminals and appropriate investment conditions, will contribute to an **increased intermodality of freight transport and the development of logistics services,** consequently translating into economic growth and improved competitiveness of the region, entrepreneurship, and employment, strengthening the leading position of the region in the logistics sector. Of key importance for further development will be the cooperation of transport and logistics industry entities, which will enable the region to fully tap into the potential of the existing experience for synergy effects.

[222] Routes - elements of the railway transport system based on the hub-and-spoke system, running radially to the destinations from the main transport hub (i.e. the Solidarity Transport Hub).

[223] High-Speed Rail is a passenger rail transport subsystem characterized by significantly higher commercial train speeds than other train routes; it is comprised of dedicated high-speed routes allowing speeds equal to or greater than 250 km/h, and routes of high-speed standard, allowing speeds of up to 200 km/h.

[224] According to the Solidarity Transport Hub concept, in addition to HSR trains, the new railway lines will be host to regional traffic, enabling operators to offer fast regional connections between Łódź and Wieruszów, Sieradz, Łowicz, and Skierniewice, among others.

Planned measures:

3.3.1. Improving the road accessibility of the region, among others by:

- completing the strategic road system along with efficient connections with interchanges, including, e.g. support for the construction, reconstruction, and extension of motorways and expressways; construction of new interchanges; construction of new sections of access roads to interchanges and adaptation of the existing ones to adequate standards, particularly in the area of Łódź,
- developing and improving the technical parameters of national, regional , district, and borough roads, including, inter alia, support for the construction, reconstruction, and expansion of roads and bridges (including investments improving road traffic safety); construction of bypasses; implementation of intelligent transportation systems[225] (e.g. traffic control system, road information, etc.).

3.3.2. Integrating the Lodzkie Region in the high-speed railway system and increasing the rail accessibility of the region, among others by:

- constructing and expanding railway lines supplying the Solidarity Transport Hub, including, among others, the construction of a new high-speed railway line Warsaw - Solidarity Transport Hub - Łódź - Wrocław/Poznań, projected to enable fast regional traffic,
- developing the key elements of the railway system, including, among others, the support for: improvement of technical parameters of existing railway lines (e.g. electrification of lines, elimination of bottlenecks); construction of new railway lines (e.g. Bełchatów - Wieluń, Łódź - Piotrków Trybunalski /Bełchatów, Skierniewice - Rawa Mazowiecka); construction and modernisation of point infrastructure (e.g. stations and railway stops as well as road and railway crossings, including the implementation of collision-free solutions); implementation of intelligent transportation systems (e.g. ERTMS).[226]

3.3.3. Increasing the airline accessibility of the region, among others by:

- supporting the implementation of the Solidarity Transport Hub,
- ensuring a sufficient number of domestic and international air connections.

3.3.4. Creating an attractive and competitive offer of public transport, among others by:

- improving the quality of public transport infrastructure, along with the infrastructure catering to persons with special needs, especially disabled persons and the elderly, including, among others, supporting the retrofitting and implementation of integrated transfer hubs (along with Park&Ride and Bike&Ride[227] parking systems and functional and spatial connections with the transportation network); modernisation of bus and train stations; construction and reconstruction of tramway infrastructure (including agglomeration infrastructure); creation of infrastructure and organisational solutions to privilege collective urban transportation; implementation of intelligent transportation systems (including traffic control),
- developing the fleet and rolling stock, among others by supporting the purchase of modern zero- or low-emission fleet and rolling stock (buses, streetcars, and trains), e.g. equipped with alternative propulsion systems, and catering to persons with special needs, including persons with disabilities and the elderly,
- strengthening the system of public mass transport connections, including, among other things, providing support for the development of the existing network of connections and increasing its frequency; coordinating timetables; integrating tariff and ticket plans.

3.3.5. Increasing the intermodality of freight transport and developing logistic services, among others by:

[225] Intelligent Transportation Systems (ITS) is a term that refers to a broad set of various tools based on information technology, wireless communication and vehicle electronics enabling efficient and effective management of transportation infrastructure and efficient rendition of traveler services. In ITSs, the functioning of transportation is highly supported by integrated solutions in the areas of measurement (sensors), telecommunication, IT and information, as well as automatic control.

[226] ERTMS (European Rail Traffic Management System) is a project for a unified signaling system to ensure rail transport interoperability.

[227] Bike&Ride (B&R) is a system of bicycle parking that allows users to leave their bicycles in a secure designated location and continue their journey using public transport.

- developing intermodal terminals, among others by supporting the extension of the existing intermodal terminals; construction of new facilities; retrofitting, e.g. with IT systems, to improve the quality of terminal operations,
- shaping investment conditions conducive to the development of logistics in the TEN-T network influence zone and in the strategic regions of logistic functions development, among others by supporting the preparation of investment areas, construction and expansion of warehouse parks.

Operational objective 3.4: Modern energy sector in the Lodzkie Region

It is projected that the changes in the energy system in the Lodzkie Region foreseen until 2030 and ultimately until 2050 will involve a gradual reduction in the production of energy generated from conventional sources, and a transition to energy production based on low-carbon, innovative sources, while ensuring energy security in the national balance of energy production and social responsibility. The Bełchatów Power Complex will play a stabilizing role in the power system with significantly lower carbon dioxide emissions until the share of alternative energy meets the demand. As part of the process of system transformation, distributed and prosumer energy from RES will be developed (e.g. energy clusters and energy cooperatives), also through the better use of potential for, among others, geothermal and photovoltaic sources of energy. Instability of energy produced from RES will require the implementation of energy storage facilities.

Phasing out coal as the main source of energy production will cause a significant loss of production capacity at the Bełchatów Power Plant, which will not be replaced by RES-based power plants. Therefore, in accordance with the National Energy Policy until 2040, it is assumed that a nuclear power plant may be located in the Bełchatów region after 2033, which will make it possible to meet the growing demand for energy.

Another extremely important element of ensuring energy stability in the Lodzkie Region is the **development of electricity transmission and distribution networks** including nodal elements. It is assumed that the **modernisation of power grids** will be based on the **application of intelligent systems** that use modern and innovative solutions and equipment to control, regulate and secure the grid. They will contribute to the reduction of network failure rate and energy losses during transmission, and will result in savings in energy generation sources by allowing to generate less energy for the same demand. Surplus of produced electric energy can be stored though processing into other forms of energy (e.g. heat - power to heat[228] gas fuels - power to gas[229]). The **development and modernisation of the network of transmission and distribution pipelines** will also influence the energy security of the region. It is assumed that the actions undertaken in the field of gasification will focus on increasing the pressure and increasing the diameter of pipelines, as well as diversifying the directions of gas supply. In addition, the development of the **gas distribution network** should aim at the introduction of **intelligent systems**, such as increasing the level of automation and monitoring, implementing new technological solutions, improving safety and introducing real-time metering, as well as introducing the possibility of transporting gaseous fuels other than natural gas: biomethane, synthetic methane, coal seam gas and hydrogen. One lingering problem in this regard is the unprofitability of a planned gas distribution network in rural areas.

Planned measures:

3.4.1. Developing a strategic electric energy system, among others by:

- implementing low-emission, innovative solutions in energy production, e.g. hydrogen production(for the power and transport sectors), synthesis of hydrogen with carbon dioxide and use of the resulting methane for electric energy production,
- supporting the construction and development of installations for combustion of fuels from renewable sources in the energy sector, along with RES fuel production technologies,
- maintaining and expanding the power grid, including support for the construction of smart grids; expansion and modernisation of existing substations and grids (including smart grids),

[228] Power to heat is a technology that uses excess electricity to produce heat (heat pumps).
[229] Power to gas is a technology that uses excess electricity to produce gaseous fuel through electrolysis (hydrogen) and methanisation (methane) processes.

- maintaining energy production at the Bełchatów Power Plant until the energy mix is changed,
- supporting the construction of installations for obtaining energy from RES (e.g. geothermal, photovoltaics),
- supporting the construction of energy storage facilities, including storage through the conversion into other forms of energy,
- supporting the development of prosumer and dispersed energy generation,
- supporting the creation of energy clusters or energy cooperatives,
- supporting research enabling RES Energy acquisition.

3.4.2. Developing a strategic[230] gas distribution system, among others by:

- supporting the construction, expansion and modernisation of high-pressure gas pipelines, including support for the construction of intelligent networks,
- supporting the construction, expansion and modernisation of high-pressure gas stations, including support for the construction of intelligent networks.

Operational objective 3.5: Rationalisation of waste management

In waste management, actions are to be taken to protect the environment against waste pollution, first of all in accordance with the waste management hierarchy, by promoting actions preventing the generation of waste and then using waste as a source of valuable raw materials, which will lead to the protection of depleting natural resources. This is supported by the assumptions of **circular economy**, whose main objective is to prevent waste generation through, among others, the development of resource-efficient technologies. It is assumed that the **system of communal waste processing facilities** and that of **selective waste collection will be improved**, taking into account the optimisation of logistic solutions and the economisation of raw material recovery,[231] along with increased supervision over waste collection in order to improve the quality of secondary raw materials obtained. The management of communal sewage sludge generated in sewage treatment plants in the process of sewage treatment, efforts are projected towards maximizing the use of the nutrients contained therein as valuable raw materials e.g. for agriculture, while meeting all requirements concerning sanitary, chemical and environmental safety (implementation e.g. within the KPOŚK). These actions will translate into minimizing the amount of landfilled waste, thus the number of landfills, and ultimately eliminate the landfilling of recyclable and biodegradable waste.

Additionally, minimizing the effects of environmental pollution with waste is planned through the **reclamation of closed landfills** and **elimination of illegal waste disposal sites** (unauthorized 'wild' dumps, pits and degraded post-industrial areas). Also projected is an improvement of the medical and veterinary waste neutralisation system.

In the Lodzkie Region, the efficiency of asbestos waste removal will be increased under the "Program for Asbestos Removal 2009-2032." The inventory of asbestos products will be continued and they will be disposed of by depositing them on expanded and dedicated landfills.

Planned measures:

3.5.1. Developing infrastructure towards circular economy, among others by:

- improving the system of communal installations for the processing of non-segregated (mixed) communal waste or residues from the processing of such waste, installations for the processing of bio-waste and installations for the thermal processing of communal waste or waste from the processing of communal waste with energy recovery, through their construction, expansion and modernisation,
- adapting the communal waste collection system to the requirements of circular economy, among others by supporting the construction, expansion, modernisation of: collection points for selectively

[230] Includes high pressure gas transmission pipelines.

[231] The economisation of communal waste management is one of the objectives of the EC package of circular economy, seeking to create mechanisms to achieve synergies between environmental and economic objectives (source: "Packaging waste management system in Poland against the challenges of the closed-circuit economy project" - Analysis of the Sobieski Institute No. 78, Warsaw, January 2016).

collected waste, repair points for damaged equipment; communal waste sorting plants and transfer stations as well as the development of a deposit system for packaging,
- improving communal sewage treatment plants with regard to the modification of sewage sludge treatment methods.

3.5.2. Reducing the negative impact of waste on environment, among others by:
- reclaiming closed landfills for non-communal waste, including hazardous waste,
- recultivating closed communal waste landfills,
- improving the system for disposal of medical and veterinary waste,
- eliminating illegal waste depositing places, among others by inventorying and monitoring the so-called wild dumps, post-mining pits and degraded post-industrial areas.

3.5.3. Improving the efficiency of asbestos removal from the Lodzkie Region:
- developing landfills for deposition of asbestos waste,
- constructing landfills for deposition of asbestos waste,
- supporting efficient asbestos removal.

Operational objective 3.6: Increased accessibility of ICT services

The accessibility and quality of digital technologies determines both the standard of living of the population and the efficient functioning and development of the local economy. In the face of dynamically growing demand for digital technologies, it is of paramount importance to eliminate territorial disparities in the **access to high-speed broadband Internet**. Therefore, an **expansion of the fiber-optic telecommunications network and the 3G, 4G, in particular the construction of 5G mobile network**, has been provisioned. In the context of network development, it will be crucial to ensure its safe use, along with the **development of public access points** (wi-fi), so as to enhance the accessibility of **e-services** for the residents.

Planned measures:

3.6.1. Developing wired and wireless ICT infrastructure, among others by:
- supporting the maintenance, expansion and construction of the linear elements of fiber optic networks, including access nodes,
- supporting the maintenance, expansion and construction of the 3G and 4G (LTE) infrastructure,
- supporting the construction of 5G infrastructure.

3.6.2. Developing, implementing and disseminating modern e-services, among others by:
- developing systems enabling the realisation of e-services, including e-health and telemedicine, e-training, along with systems for citizen and entrepreneurial services,
- implementing programs supporting the population in using e-services,
- supporting the implementation of actions in the field of cyber security and network protection,
- developing public Wi-Fi networks.

HORIZONTAL OBJECTIVE: EFFICIENT AND RESPONSIBLE REGIONAL MANAGEMENT

The condition for the effective implementation of developmental objectives and goals is an efficient sphere of development management, which ensures that the Strategy does not remain a collection of undelivered postulates. Regional management should be **effective,** which means that the results of actions taken should be achieved at the lowest possible and reasonable cost. This can be attained through actions aimed at improving the competencies of the administration, development of a knowledge base about the region, and optimisation of procedures. Furthermore, the increased use of **modern information and communication technologies** necessary for the creation of e-government, including the relationship with citizens and other local governments and the

creation of databases, will also help improve management efficiency. The extensive use of modern technologies, steadily increasing professionalism of staff, and efficient and transparent procedures, are projected to translate into a **citizen-friendly administration**.[232]

In view of the current threat of COVID-19 and the possible emergence of epidemiological threats in the future, it becomes crucial to ensure the cooperation of public services in the event of an epidemic, along with the integration of communication and management systems between the services responsible for safety and rescue, including the appropriate equipment of emergency services, education of the public in terms of behaviors and habits that increase public safety.

An important element of **responsible** management is the implementation of the concept of sustainable development at all levels of public administration. Public administration should make better use of existing instruments of commissioning public tasks, taking into account environmental aspects (**green procurements**) and **social clauses.**

Cooperation of all stakeholders in the Strategy, especially between the regional and local governments, which fosters the implementation of integrated projects, is of key importance. It is therefore necessary to take actions to encourage local government units, the private sector and social partners to cooperate and to promote and raise awareness of the benefits of cooperation. The cooperation of local governments will contribute to increased cost-efficiency of implemented projects and public services provided. The implementation of the Strategy will also be facilitated by establishing partnerships in the areas of **supra-regional and international cooperation**.

An extremely important element of management is to **shape the region's space in a sustainable way**, i.e. making it possible to use its potential to increase the economic competitiveness of the region, improving the quality of life while maintaining the most valuable natural, landscape and cultural assets and eliminating the diagnosed barriers and inequalities in development. The communes have the most important competences in spatial management by preparing studies of conditions and directions of spatial development and by drawing up local spatial management plans, which constitute the act of local law. An additional tool for achieving the desired state of space will be landscape audits, conducted to determine priority landscapes. Under rational spatial development, it is necessary to coordinate the planning processes and cooperation of all entities whose interests are vested in a shared space.

The actions taken as part of the Strategy are expected to yield a modernized administration, improved staff competences, integrated development planning and management systems, increased public safety, a more efficient use of EU funds, and a more rational approach to space management. The development of cooperation between local government units, entrepreneurs, universities and residents will contribute to the effective implementation of the assumed development goals, strengthening the competitiveness, improving quality of life, and activation of the region's residents.

Planned measures:

a. Improving the knowledge and skills in planning and management of the development of local government employees at all levels, among others by:

- supporting trainings for administrative employees of local governments, workshop systems for developing and implementing shared projects for teams featuring representatives of communes and districts,
- disseminating expert support, developing systemic cooperation with the scientific, business and social environment and exchange of best practices for local government units,
- increasing competences in the field of the application of the Public Procurement Law, especially in the field of socially responsible procurement and "green procurements" and the Public-Private Partnership Act,
- increasing competencies in the field of integrated, spatial and strategic planning.

b. Popularizing the use of ICT technologies in development management, among others by:

[232] One of the three recommendations made in the regional Analysis of Innovation Diffusion Bottlenecks is "a turn towards friendly public administration."

- popularizing the use of available, tested tools for monitoring the quality of public services and the quality of life among local governments,
- increasing the use of information and communication technologies in managing development and crisis processes, communication with residents and entrepreneurs and remote execution of tasks,
- digitalizing the resources of public institutions,
- creating and updating of databases, including the spatial information systems and geodetic public registers,
- conducting promotional campaigns on the regional self-government websites, including the use of social networking services,
- providing institutional support to and improving resident safety; integrating management systems and information exchange,
- strengthening the position of the units monitoring the socio-economic and spatial situation of the region, including the Regional Territorial Observatory of the Lodzkie Region.

c. Strengthening the cooperation and partnership of local governments, among others by:

- promoting and raising awareness of the benefits of cooperation in the implementation of the Strategy and projects, including the creation of platforms for the exchange of knowledge, experience and good practices, introduction of mechanisms encouraging local governments to cooperate and implement development projects and integrating the sources of funding for local government units and other entities,
- participating in cooperation networks between local governments at different levels nationally and internationally; implementing interregional and international projects,
- stimulating regional economy through the appropriate use of public funds, among others by using green public procurement clauses,
- promoting and implementing model revitalisation solutions that integrate social, economic, technical and spatial aspects and involve the largest possible stakeholder groups: local government officials, entrepreneurs, scientists, inhabitants and social activists,
- developing the cooperation between the public and private sector (public-private partnership) and that of the public sector with the non-governmental sector, including the promotion of local partnerships for innovative development,
- initiating and coordinating cooperation for branding and promotion of the Lodzkie Region,
- including civic society and non-governmental organisations in the process of local and regional development management, including the utilisation of LEADER/CLLD instrument,
- ensuring the cooperation of services responsible for epidemiological safety, along with their adequate equipment.

d. Implementing an integrated and territorially oriented policy of sustainable spatial development, among others by:

- implementing solutions ensuring the consistency of planning and strategic documents at various levels of planning and programming, e.g. in the process of consulting the documents,
- supporting communes in the process of spatial planning and raising awareness of threats related to the lack of sustainable spatial policy,
- increasing the scale and effectiveness of landscape protection, including the use of results of landscape audit in the space management process,
- supporting the processes increasing the attractiveness of urban and communal spaces, in particular revitalisation and creation of friendly public spaces and green areas (including gardens, parks),
- supporting activities and investments contributing to the effective use of areas designated for housing development, e.g. through densification of development of areas with adequate communication services, equipped with technical infrastructure networks, in particular sewage systems,
- supporting activities and investments improving the quality and care of spatial order,

- supporting activities and investments improving the quality of life of inhabitants and living conditions,
- supporting city management processes, including the implementation of energy efficiency control systems,
- promoting sustainable development of rural areas, assuming the protection of open, agricultural and afforested areas from development,
- ensuring accessibility of basic and supralocal public services, in particular in peripheral areas.

VI. INTEGRATED STRATEGIC PROJECTS

The **operationalisation** of the objectives of the Strategy 2030 and the project-based approach applied at the national level is expressed through the **Integrated Strategic Projects.** These **projects are a strategic selection and prioritisation of actions envisaged within the framework of development policy.**

Each of the integrated projects described below allowed the **integration of objectives and actions formulated in the economic, social and spatial spheres**, which, when taking into account the activities to improve the efficiency of the region's management, will enable to synergize the implementation of the Strategy and the pursuit of sustainable development of the region. Integrated Strategic Projects are bundles of projects whose primary objective is to impact all areas specified in the Strategy. Within the framework of the Integrated Strategic Projects, a consolidation of forces and resources is envisioned in the most important areas throughout the region requiring support development-wise.

1. LODZKIE - A GREEN AND ACTIVE REGION

Objective

The aim of the project aimed at shaping green areas and protecting nature in the Lodzkie Region is not only to improve the quality, accessibility, and attractiveness of recreation and sports areas but also - thanks to the creation of new green spaces - better adapt to climate change, improve the quality of environmental resources, and strengthen the bonds between residents involved in creating community gardens. Spatial order will be improved by limiting the process of uncontrolled dispersion of development. Biodiversity of green areas will be preserved. Thanks to the increase of green areas, patency of ecological and urban ventilation corridors will be ensured. Investments in cycling infrastructure will increase the comfort and safety of bicycle traffic. The quality of public spaces, landscape, nature, and quality of life in the region is projected to improve, and the image of the Lodzkie Region as the "green region" will render the region an attractive place to live and spend leisure time. As a result of improving local microclimatic conditions and increasing physical activity, population health will be improved, life expectancy will be extended, and the psychophysical fitness of the region's residents will be increased.

Activities

Activities undertaken within the project will focus on creating an attractive space for individual physical activity and family recreation. The Strategy provisions to create and develop multifunctional green areas, in particular of a linear nature, which will add to the network of local and regional green areas, including river valleys, parks, educational, thematic and allotment gardens and forests. Activities will be carried out to expand legally protected areas in accordance with Article 6 of the Natural Protection Act dated 16 April 2004. The Strategy envisions projects utilizing the aforementioned arease for tourist, recreational and sports purposes, in particular throguh the construction of cycling infrastructure (including bicycle paths), recreational infrastructure, walking paths, playgrounds for families with children, water reservoirs with bathing functions, and water sports and sanitary infrastructure. The project also envisions the construction of modern forms of nature education, accompanied by campaigns promoting healthy lifestyles and popularizing the idea of community gardens; also envisioned is the promotion of the tourist assets of the Lodzkie Region, advertising it as a place for active leisure. Support will also be provided for social initiatives related to the aforementioned tasks.

2. LODZKIE – A CONNECTED REGION

Objective

The aim of the project is to create an efficient, attractive and accessible public transport (including, in particular, the needs of persons with limited mobility), which would provide a viable competition to individual car transport. The project envisions increasing the share of rail travel in the total number of trips; reducing traffic exclusion and increasing the mobility of residents; improving access to the labour market, government offices, education - including higher education - and services; reducing the number of accidents on the roads, improving traffic flow and reducing air pollution - linear emissions generated by road transport; savings associated with

reduced travel times; creation of safe, aesthetically pleasing and barrier-free public spaces around interchanges; full use of the opportunities arising from the implementation of landmark railway investments currently carried out or scheduled for implementation in the current decade in the Lodzkie Region.

Activities

Implementation of functional and integrated rail-based interchanges, together with a range of traveler facilities; construction of parking spaces for individual car transport (Park&Ride, Kiss&Ride) and for bicycle transport users (Bike&Ride); purchasing rolling stock for passenger rail connections; adapting the transport offer to changing needs - developing the network of regional rail connections and increasing the frequency of service, along with the development of a system of regional bus connections, transporting passengers to the railway transfer hubs; supporting investments in attractive public spaces functionally connected to interchanges (e.g. squares, green lanes) and roads leading to railway stations and stops - with special attention to the needs of pedestrians, cyclists and persons with reduced mobility.

3. CLEAN ENVIRONMENT

Objective

The main objective of the project is to reduce the impact of human activity on the environment and to protect the environment from pollution. The projected improvement of air quality will help improve population health. Changes in the spatial sphere, consisting in reduction of the area occupied by waste dumps should also be expected, which will translate into better living conditions and enhanced local landscape assets. Another provision is to improve the quality of surface waters, to restore tourist values of rivers and water reservoirs and to mitigate the effects of drought that negatively affect the condition of agriculture.

Activities

One of the main elements of the fight against low emissions will be connecting buildings to the heating network or replacing inefficient heat sources in areas not covered by the heating network, as well as supporting thermo-modernisation of buildings. In addition, green zones will be developed along traffic routes in cities, along with air pollution monitoring systems and air quality notification systems.

The project also provisions activities in the field of circular economy. The region will seek to improve the system of collecting, sorting and processing waste. The use of waste as a source of raw materials and energy will be increased. Projects are planned for the reclamation of closed communal waste landfills and inactive landfills for non-communal waste, including hazardous waste. The above activities will be complemented by the creation of a monitoring system for installations and processes and products of circular economy.

It is assumed that investment projects will be carried out in sewage systems, water supply systems and wastewater treatment plants, together with the promotion of agricultural best practices to reduce the level of water pollution, including the use of bio-waste from animal husbandry in the biogas sector. The implementation of the project will also involve the construction of water retention facilities, including multifunctional reservoirs, activities for water reuse and rainwater management. The project also envisions the implementation of actions in the field of blue-green infrastructure (including rain gardens, green roofs, rainwater tanks). Educational programs and campaigns increasing ecological awareness of residents and officials alike, as well as construction or adaptation of ecological education centers and field laboratories will also be a part of the project. Support will also be provided for social initiatives related to the aforementioned tasks.

4. LODZKIE – AN INNOVATIVE REGION

Objective

The aim of the project is to improve the competitiveness and innovation of enterprises in the Lodzkie Region; increase potential in the field of research and innovation; develop entrepreneurial attitudes and to improve conditions for the development of entrepreneurship; increase access to ICT services and develop public e-services. The project also aims to mitigate the socio-economic effects of the transition towards a climate neutral economy through the implementation of a new economic model.

Activities

As part of the project, it is envisioned to support the entities of the regional economy by providing them with tools and solutions to increase their competitive advantages. The project assumes to provide comprehensive support for activities that stimulate cooperation between science and business as well as implementation of innovative solutions in companies. The essence of the project will be to support the development of a new, greener and more diversified model of economy.

Particular emphasis will be placed on expanding access to modern digital technologies, development of wire (including fiber-optic) and mobile infrastructure with fast transmission (including 5G). The project assumes the construction of systems enabling the provision of public e-services (e.g. e-government, e-health, e-security).

Apart from activities directly influencing the economic use of innovations, other essential projects concentrate on supporting entrepreneurship and its development, e.g. through financial and advisory support for prospective business owners.

5. LODZKIE – A PROFESSIONAL REGION

Objective

The aim of the undertaken activities will be to extend the educational offer of the Lodzkie Region and improve the quality of education throughout the region, as well as to increase the region's competitiveness in the context of demographic and economic changes, and the ongoing transformation of the labour market.

Activities

The project provisions to improve access to modern techniques and technologies at all stages of education, and the development of key competencies to facilitate adaptation to rapidly changing living conditions. It is necessary to properly diagnose employers' needs and support the appropriate adjustment of the educational offer to the labour market requirements. The project assumes the development and promotion of vocational education with the active participation of the regional economic sector and in line with the latest economic and technological trends, including the preparation and implementation of the Strategy of vocational education for the development of smart specialisations in the region. It also assumes the realisation of projects inscribed in the idea of lifelong learning, among others with the use of opportunities and tools developed within the Integrated Qualification System. An important element of the project will also involve activating and increasing competencies of the elderly (including digital competence).

Moreover, actions will be taken to protect the residents projected to be most affected by the energy transition of the region's economy, providing them with career transition opportunities and stable jobs in other sectors of the economy.

6. LODZKIE – A SUPPORTIVE REGION

Objective

The main objective of the project is to build resilient social capital, which constitutes the pillar of socio-economic development in the region and contributes to the improvement of living conditions of individuals and families. In particular, the aim of the project will be to strengthen the sector of non-governmental organisations and the sector of social economy; reduce the scale of poverty; foster stronger social integration of individuals and families at risk of exclusion; strengthen the ties of residents with the region and their respective local communities, and increasing the participation of residents in regional events and initiatives.

Activities

The implementation of the project will focus on supporting individuals and families as well as third sector entities. Also important will be actions supporting the formation of civil attitudes and dissemination of citizen participation mechanisms. The project will also include activities in the field of revitalisation of degraded areas, supporting the process of bringing them out of crisis.

In connection with the diagnosed needs, as well as the ongoing changes in the demographic structure of the region, the project envisions the implementation of activities related to improving access to various forms of assistance, including social services provided by local communities (deinstitutionalisation of services). The project also stipulates to develop the infrastructure of day care centers and sheltered and assisted housing. Another

aspect of the project will involve activities focusing on improving widely understood accessibility, including the adjustment of public space to the needs of persons with disabilities and the elderly. The Strategy deems it essential to coordinate activities for social integration and adaptation of various forms of support to the ageing society. The project provides assistance for families, including families with children in crisis (especially with upbringing and care problems). Strengthening the potential and competitiveness of social economy entities will also be addressed in the project.

7. LODZKIE – A HEALTHY REGION

Objective

The objectives of the project include improving population health, increasing life expectancy, reducing costs associated with employee absenteeism, increasing the awareness of preventive healthcare, and improving the quality of health care infrastructure.

Activities

The implementation of the project will consist in the improvement of spatial accessibility and quality of healthcare services, especially in the field of cardiovascular diseases, oncological treatment, stroke treatment, psychiatric healthcare, rehabilitation and long-term, palliative, geriatric and hospice care. The project is also expected to reduce exclusion and increase innovation in the area of health through the implementation of applications and construction of systems enabling the provision of e-health services (including telemedicine). Special emphasis will be placed on the health care needs of seniors, including those provided in the form of outpatient and community-based services. The COVID-19 pandemic has demonstrated that it will be essential to maintain easily activatable emergency infrastructure, e.g. in an epidemic situation. Projects aimed at the dissemination of prevention, e.g., through information and educational campaigns or the implementation of health programs, as well as activities promoting healthy lifestyles, will also be of importance.

Due to the fact that the scope of **Integrated Strategic Projects** extends beyond the sphere of direct influence of the regional self-government, the Projects are expected to offer a **broad platform of cooperation for public and private stakeholders**. Joint actions of various entities from the region in the most important areas will ensure greater efficiency of the implemented activities. Accumulation of resources in selected projects will also increase the efficiency and effectiveness of public and private fund spending. For effective implementation, it is possible to draft detailed implementation plans for individual projects.

The development policy will also support other innovative or essential projects, not defined in this document, as long as they are consistent with the vision and objectives set out in the Strategy. Their implementation together with the implementation of Integrated Strategic Projects will affect the achievement of the objectives provisioned in the Strategy in the most comprehensive way.

VII. TERRITORIAL DIMENSION OF THE STRATEGY

The actions of the regional self-government strive to achieve a territorially balanced development of the entire region. The Strategy objectives and measures planned in the economic, social and spatial spheres indicate the most important areas of intervention of a horizontal nature, which are strategic from the perspective of the region. However, they do not account for regional diversity, nor do they bring out all the strengths of the respective territories, or address the locally-specific weaknesses and deficits.

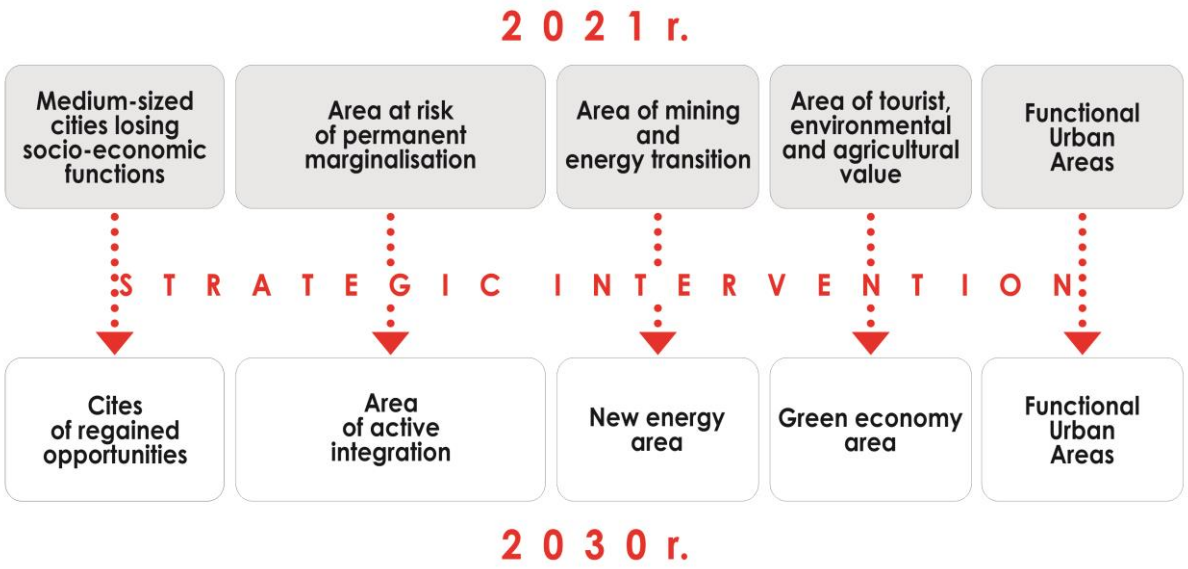
The purpose of the territorialisation of the Strategy is, among others, to target the provisioned interventions in the areas in need of special support and to identify the most important actions for each of these areas, ensuring that their adoption will optimally contribute to solving local problems and activating the endogenous potential. This measure is projected to rationalize the disbursement of funds, directing them to places where they are critically needed and will yield the greatest positive effect. In this way, the territorialisation of the Strategy is a response to developmental disparities and will contribute to their reduction. It also takes into account the differences in the needs and functions of cities and rural areas.

The approach proposed in the Development Strategy of the Lodzkie Region 2030 complies with the new development model indicated at the national level (SRD and NSRD 2030), i.e. the development which is responsible and socially and territorially sustainable.

Areas of Strategic Intervention

In accordance with the Act on the Principles of Development Policy, an **area of strategic intervention** is an area defined in the development strategy with identified or potential functional links or with specific social, economic or spatial conditions that determine the existence of barriers to its development or permanent, activatable development potentials, to which public intervention that combines investments (in particular economic, infrastructural or HR-related, financed from various sources) or regulatory solutions is addressed. The Strategy indicates two types of areas of strategic intervention: national and regional.

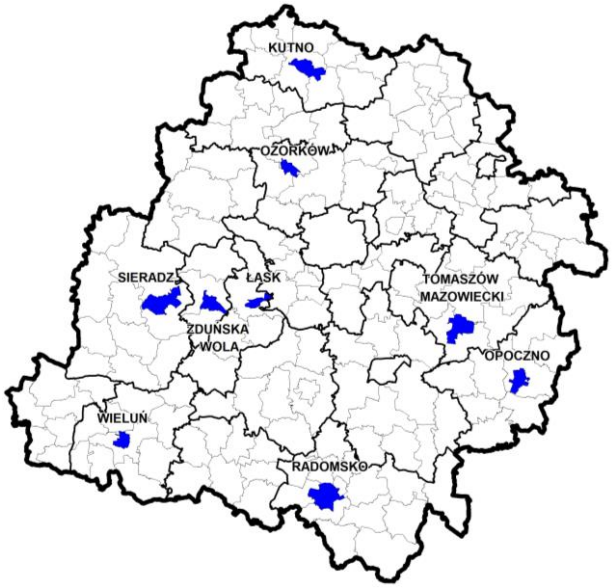
Thanks to the territorially oriented **strategic intervention**, the areas across the Lodzkie Region in which development problems have been identified or special advantages have been noticed will achieve a stable level of social and economic development in the perspective of 2030. **Medium-sized cities will regain their development opportunities** and strengthen their position in the settlement structure of the region. New development incentives in **marginalised areas** will enable **active integration** of rural communes and sustainable development of the entire region. An important role in the region's development will be played by **green economy areas**, where special emphasis will be placed on the development of agricultural and tourist functions, as well as environmental protection, and the actions undertaken in those areas will contribute to the implementation of the concept of shaping the space of the Lodzkie Region as a Green Garden of Poland. Thanks to **just transition**, which places people as its most important subjects, the Bełchatów Basin area will receive a much needed boost *en route* to its social and economic re-development. Strengthening the connections between urban areas and neighboring communes within the **Functional Urban Areas** will allow to jointly overcome development barriers in those areas and increase their settlement attractiveness.



1. CITIES OF REGAINED OPPORTUNITIES

In accordance with the National Strategy of Regional Development 2030 (including its update),[233] 9 medium-sized cities losing their socio-economic functions were distinguished in the Lodzkie Region: Kutno, Łask, Opoczno, Ozorków, Radomsko, Sieradz, Tomaszów Mazowiecki, Wieluń, Zduńska Wola.

Fig. 76. Cities of Regained Opportunities
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region



In the case of medium-sized cities losing their socio-economic functions, the undertaken activities should focus in particular on stopping further loss of functions and restoring them in the next phase. The type, scope and dimension of intervention will depend directly on the specific needs and potentials of the respective cities. In accordance with the NSRD 2030, it is assumed that the intervention will be aimed primarily at the reconstruction of the economic base and strengthening of the role of these cities as centers of social and economic activity; elimination of development barriers; improvement of investment attractiveness; development of entrepreneurship; activation of local human resources; stimulation of local initiatives, as well as improved accessibility of public services.

The projected support on the regional level will be complementary in relation to the measures proposed at the national level, and will cover various types of measures and projects implemented within the framework of all strategic and horizontal objectives.

2. AREAS OF ACTIVE INTEGRATION

[233] Source: NSRD 2030 and Updated version of "Delimitacja miast średnich tracących funkcje społeczno-gospodarcze" [Delimitation of medium-sized cities losing their socio-economic functions] (Śleszyński P., Institute of Geography and Spatial Planning of the Polish Academy of Sciences, Warsaw, 2019).

The areas of active integration consist of areas at risk of permanent marginalisation identified at the national level in accordance with the National Strategy of Regional Development 2030 (including its updated version),[234] as well as complementary regional areas at risk of permanent marginalisation. In total, 25 communes have been identified as such in the Lodzkie Region, including 18 communes identified at the national level (Burzenin, Błaszki, Grabów, Goszczanów, Daszyna, Dąbrowice, Klonowa, Krośniewice, Łanięta, Masłowice, Nowe Ostrowy, Oporów, Przedbórz, Sadkowice, Uniejów, Wielgomłyny, Żychlin, Żytno) and 7 at the regional level (Aleksandrów, Budziszewice, Czerniewice, Łęki Szlacheckie, Ręczno, Żarnów, Żelechlinek).

Fig. 77. Areas of Active Integration
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

In the areas at risk of permanent marginalisation, the undertaken activities should strive to initiate new development impulses, while also strengthening the existing potentials and their active integration in all aspects of social and economic development. The most important measures include, among others, the development of local entrepreneurship, improvement of communication accessibility, in particular with respect to the development of public transport, measures with respect to professional activation, improvement of the inhabitants' qualifications, social integration and development of technical infrastructure (in particular water supply, sewage systems and ICT infrastructure), along with the improvement of access to basic public services.

3. GREEN ECONOMY AREA

The green economy area includes 94 communes located outside the Functional Urban Areas, and is characterized by the dominance of agricultural and natural functions, while also being predisposed to tourism development thanks to the endogenous potential of the natural environment (river valleys, areas valuable in terms of nature and landscape) and cultural heritage (areas and monuments), as well as tourism development.

In the communes with high agricultural potential, agricultural land should be protected and the current leading function developed. Activities related to rational agricultural management will be important, among others the proper selection of crops adapted to environmental conditions, the use of the production potential of permanent grassland for animal production, the rational use of fertilizers and plant protection products. With respect to increasing the profitability of agricultural production, it will be important to improve the structure of agricultural holdings, introduce new technologies and innovations, invest in productivity growth, develop the cooperation of farmers between themselves and with the processing industry, develop local markets and market places. One important operational guideline is the support of agri-food processing. In the area of the communes

[234] Source: NSRD 2030 and Updated delimitation of problem areas for 2018 (Śleszyński P., Bański J., Degórski M., Komornicki T. et al, Institute of Geography and Spatial Planning of the Polish Academy of Sciences, Warsaw, 2019).

located in the vicinity of protected and valuable natural areas, the land use will be determined by a system of sustainable agriculture, and high quality food production (including the development of organic production).

It will also be important to support activities enabling economic diversification of these areas, in particular those connected with developing active tourism, supporting tourist base (including ecotourism and agrotourism), development of tourist trails and cycling infrastructure, creating brands and market demand for balneological, spa and rehabilitation services, building integrated tourist products based on cultural, environmental and landscape assets, as well as cultivating traditions, creating an image of the Green Economy Areas as attractive for tourists, which will help build a recognizable tourist brand of the region.

Fig. 78. Green Economy Area
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

Important to the development of both the agricultural function and tourism in the region will be activities related to the protection and improvement of the environment and strengthening the resistance to climate changes and natural threats in the Areas of Strategic Intervention. This will require a number of interventions, such as increasing the retention capacity of drainage basins (e.g. introduction of afforestation, bushes, tree planting, construction and modernisation of water reservoirs, development of melioration systems, recreating ponds and wetlands) and solutions oriented at environmental protection (e.g. improvement of water cleanliness, including the creation of highly effective ecotone zones, renaturalisation of habitats and watercourses, expanding the legally protected areas), as well as investments in anti-hazard infrastructure (e.g. flood control, fire protection).

An important role in the Green Economy Area will be played by cities – centers of support for functions developed in rural areas.

4. NEW ENERGY AREA

This area is comprised of 35 communes with a joint area of 3,667 km2 and a population of 417,000, which translate into 20% of the total area of the Lodzkie Region and 17% of its population, respectively. Detailed analyses on the projected delimitation were conducted for the purposes the Territorial Just Transition Plan for the Lodzkie Region and took into account the elements of environmental (mining area, mining terrain, the cone of depression) and socio-economic (employment in the mining and energy sector, commuting to work, networks between companies, and tax revenues transferred by PGE GiEK S.A.) nature.

Changes in the energy policy under the new programming period 2021-2027 and until 2040, along with the corresponding new Development Strategy of the PGE Group and the conduct of restructuring processes in the mining and power sector and cooperating sectors, as well as the projected takeover of coal assets by the newly established National Energy Security Agency, provided the basis for the identification of the area where the adverse effects of the ongoing mining and power transformation will be most noticeable.

Within the identified transition area, it is crucial to consistently seek public acceptance for the provisioned changes, while also supporting local governments in devising a new model of economic development, including preparation of investment and non-investment projects, as well as organisational models and financial resources for their implementation. Actions in this regard were taken at the regional level during the development of the

tool playing the decisive role in getting support, i.e. Territorial Just Transition Plan for the Lodzkie Region, which follows up on the issues outlined in a more general fashion in the Development Strategy of the Lodzkie Region 2030. The plan defines the conditions for the use of support from the Just Transition Fund and ensures sustainable and equitable solutions, consistent with national and European energy and climate plans. The document takes into account the specificity of the territory, describes the transformation process, assesses the economic, social and territorial impacts of the transition to a climate-neutral economy, and prioritizes the needs and objectives for development up to 2030, necessary to achieve climate neutrality by 2050.

In addition, it will be possible to implement projects aimed at mitigating the effects of economic transition by using the financial resources available under other funds at the European, national, regional and local levels.

Just and inclusive transition seeks to prevent economic and social regress while also creating a new sustainable model of economic development, e.g. by using the potential of the Kamieńsk and Szczerców waste dumps and the reclaimed lignite opencast for tourism and sports purposes.

Fig. 79. New Energy Area

Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region

In the economic sphere, the projected activities aim to increase the entrepreneurship and competitiveness of the area, e.g. by diversifying the economic structure, developing the SME sector (especially start-ups), supporting business incubators and cluster networks, developing economic activity zones to attract new investors, supporting digitalisation, automation and innovation in enterprises, internationalizing enterprises, and promoting the local economy. Support will also be provided for innovative solutions related to clean energy and RES, including the generation and storage of energy from renewable sources, improvement of energy efficiency in residential and public buildings, and implementation of the circular economy model.

In order to reduce the adverse effects of transition processes, activities in the social sphere related to improving the quality of education and raising employees' qualifications, increasing the professional activity of inhabitants, and developing social capital and social services will be particularly important for the New Energy Area. The key intervention will involve comprehensive support for vocational counseling, job placement and organisation of professional trainings for employees leaving the mining and energy sectors and persons seeking employment.

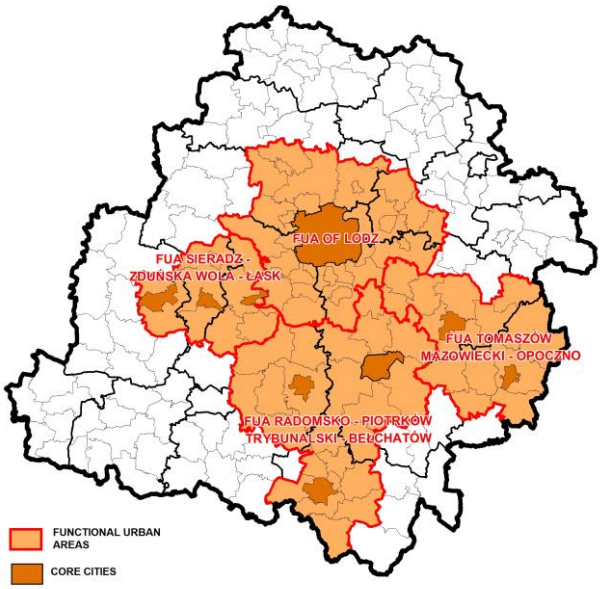
In the spatial sphere, the provisioned activities will focus, among others, on the reclamation of degraded areas to restore their natural functions or assign them new functions; improving the rate of adaptation to climate change, including counteracting water shortages, reducing emissions from the transport system, along with its integration and limiting transport and digital exclusion, as well as investments in water and sewage management.

The effects of actions taken in the social sphere will include an improved quality of life of the Area's residents, improved access to public services and attractive jobs; in the economic sphere, the projected effects will include maintaining high economic potential of the transition area, and modernisation and diversification of the economy; in the spatial sphere they will comprise improvements in the quality of space and communication accessibility.

5. FUNCTIONAL URBAN AREAS

Four functional urban areas (FUAs) were distinguished in the Lodzkie Region:[235] the FUA of the Capital City of the Region - Łódź, and 3 multicore FUAs: FUA Sieradz - Zduńska Wola - Łask; FUA Tomaszów Mazowiecki - Opoczno; and FUA Radomsko - Piotrków Trybunalski - Bełchatów.

Fig. 80. Functional Urban Areas
Source: Own study based on data from the Spatial Planning Office of the Lodzkie Region



The starting point for defining Functional Urban Areas (FUAs) was a set of rules and conditions defined by the Ministry of Development Funds and Regional Policy.[236] A FUA must have a core, i.e. a city or a group of cities that exerts an economic, social, spatial and cultural influence on the surrounding communes by creating functional links. In the case of delimitating a FUA comprised of two or more medium-sized cities neighboring on each other and losing their socio-economic functions, the cities should form a common FUA and at the same time one "FUA core." In the case of cities included in a FUA of another larger urban center (usually the region's capital city) no separate functional areas are created; instead, such cities should be incorporated into the existing FUAs. The criteria for their delimitation include demographic aspects, housing, commutes, and entrepreneurship.

Particularly important to the Functional Urban Areas is the implementation of integrated, complex projects concerning, among others, the development of sustainable public transport, increasing energy efficiency, improving the state of the natural environment, especially in terms of air quality, increasing the attractiveness of settlements, supporting the development of education and vocational training and the development of culture, tourism and recreation.

Under the new financial perspective 2021-2027, a support in the form of Integrated Territorial Investments (ITI) is envisaged for the identified Functional Urban Areas. The detailed scope of support offered as part of the Integrated Territorial Investments will be defined in the regional program in accordance with the Partnership Agreement. The ITI instrument also provisions the implementation of projects of integrated character in terms of subject or territory, focusing on development challenges that the local government units under a given FUA decide to address jointly, both at the stage of project implementation and subsequent operations.

[235] An Urban Functional Area is a special type of functional area. According to the Principles of Development Policy Act, a functional area is an area in which a relatively distinct, intensive and open system of social, economic or natural relationships exists, conditioned by the characteristics of the geographical environment (natural and anthropogenic).
[236] Ministry of Development Funds and Regional Policy. Instruction on the delimitation of urban functional areas in regional development strategies in the context of implementation of the Integrated Territorial Investments instrument in the 2021-2027 perspective.

Fig. 81. Areas of strategic intervention in the Lodzkie Region

Source: own study based on data from the Spatial Planning Office of the Lodzkie Region.

Urban and rural areas

Cities are hubs for population, economic activity and services, and as such they constitute the centers of socio-economic development. Support for the urban areas in the Lodzkie Region will be implemented through a number of operational objectives formulated in the economic, social and spatial spheres, and under the horizontal objective "Efficiently and responsibly managed region." One of the biggest problems in the cities of the Lodzkie Region is their **strong and continuous depopulation**. Reversing (or at least mitigating) this trend will involve a wide range of activities including the improvement of population health, economic strengthening of the cities and enhancement of the attractiveness of settlements achieved through, among others, revitalisation processes. Another problem is related to the **systems of public transport** in the region's cities, whose size depends on the population of a given urban center. The problem may be solved by increasing the rate of public transport investments, complementing the road network, modernizing the existing and constructing new railway routes, as well as supporting the infrastructure of sustainable means of individual transport. **Adaptation to climate change** is another problem faced by the cities in the Lodzkie Region. Actions are needed to enhance the resilience of cities to climate change and to improve the state of the natural environment. In order to boost social cohesion, the Strategy envisions to support grassroots initiatives, including projects implemented under the civic budget, the LEADER+ program, and the regional microgrant program.

The **implementation of the smart city concept** will be particularly important to the development of the cities of the Lodzkie Region. A smart city is a well-managed and resident-friendly city that uses technologies facilitating the inhabitants' functioning in urban space and protecting the environment in sustainable ways. In order to shape such a city, it is crucial to invest in the development of ICT infrastructure and information and communication technologies. Apart from the infrastructure, it is also necessary to invest in the knowledge and skills of the residents, including digital competences, while also improving the accessibility of e-services, ensuring efficient management of information and communication in contacts with the public, and increasing social participation in decision-making processes.

Rural areas of the Lodzkie Region have a wide range of functional types, from agricultural rural communes to communes with industrial, service, or multifunctional characteristics. There is also a significant number of communes located mainly in the vicinity of medium-sized and large cities, and serving typically residential functions. Despite such great diversity, they have a common denominator in the form of development barriers and problems, including various types of **transport problems**, from deficiencies in transport infrastructure to exclusion from public transport. The weakness of most rural communes is their **low economic potential**, whose strengthening will require supporting and modernizing agriculture, developing non-agricultural functions, and investments in human and social capital. Another problem of rural communes is the **condition of the natural environment**, in particular with regard to the low quality of water and air and insufficient protection of areas valuable from the point of view of natural and landscape assets. Another negative phenomenon, especially in communes located in the surroundings of medium-sized and large towns, is the **urbanisation pressure**, which results in spatial chaos, growing social costs and insufficient development of technical infrastructure in relation to the needs of the growing population.

The implementation of the **multifunctional model** of rural areas will be associated with the development of industries complementary to agriculture based on local resources. Moreover, the diversification of business activities and increase in the number of new business entities offering professional scientific and technical services will be correlated with the increase in innovation in agriculture and development of new economy sectors specific for such areas as: bioeconomy, green economy, RES. In the perspective of the coming years, due to the greening of sectors and industries in the national economy and social awareness of environmental protection, the demand for products and services in the green economy sector will increase.

In rural areas, the **demand for social services** (including care, therapeutic, integration-related services) will also increase as a result of the aging society, which will allow to put into practice the idea of social farming and to increase and diversify farm incomes. The inclusion of rural areas in the development processes will take place

through the use of the environmental and tourist potential of the region's rural areas; similarly, the leisure time services sector is projected to develop dynamically (e.g. 3E tourism).[237]

The low level of entrepreneurship and qualifications among the residents of rural areas in the Lodzkie Region indicates the need to support the **raising of professional qualifications**, enable the acquisition of market qualifications and participation in professional transition trainings, along with the creation of conditions for the development of education, as well as the equalisation of opportunities in access to educational services. Increasing transport accessibility in rural areas and eliminating deficits in telecommunication infrastructure and access to the Internet will play an important role in achieving these goals.

In view of new opportunities for job creation and the need to improve the quality of life in rural areas, it will be important to implement the concept of **Smart Villages** - i.e. a new concept in EU policy-making. The concept of Smart Villages refers to various areas of rural life and creates new opportunities, among others by improving social mobility, developing entrepreneurship and innovative solutions for environmental protection, taking advantage of the opportunities offered by bioeconomy and circular economy (including short food supply chains, renewable energy, Agriculture 4.0), providing high quality education and health services, or preventing social exclusion.

The sustainable development of rural areas will be facilitated by the **activities of the National Network of Rural Areas** and **Local Action Groups**.

Ensuring the best possible quality of the natural environment will be crucial to improving the quality of life in the Lodzkie Region. One of its main elements are green areas, which are host to family leisure, recreation, and individual physical activity. To ensure the protection of the areas of the greatest natural and landscape assets, and to preserve biodiversity, it will be necessary to pursue a rational policy both at the regional and local levels. One expression of this policy can take the form of communal preferences. In the legally protected areas (as defined in Article 6 of the Nature Protection Act dated 16 April 2004), or in the communes with the highest share of protected areas, the planned measures and activities laid down in the Strategy will also involve environmental protection, utilizing the potential of valuable natural, cultural and landscape assets, improving the quality and management of surface waters, sport, tourism, social policy, health, education, developing organic farms, producing organic and traditional food.

[237] 3E tourism (Entertainment, Excitement, Education), otherwise known as creative tourism.

VIII. STRATEGY IMPLEMENTATION SYSTEM

The implementation of the development strategy of the region is a complex, multithreaded, and cyclical process. At the first stage, the regional self-government formulates the strategy in cooperation with its partners, and then determines the conditions and procedures for its implementation, including the drafting of lower-level documents. In the implementation phase, the task of the regional self-government is to coordinate and monitor the implementation, assess its effects and - depending on the actual results and changes in the environment - update the objectives and methods of implementation in an adequate manner.

The proper process of strategic regional management is conditioned both by legal standards relating to institutional solutions and the division of competencies and responsibilities between the respective levels of government. Also important is the level of social capital and regulations conditioning the cooperation of partners.

Entities implementing the Strategy

The entity responsible for shaping the development processes and defining and implementing the development strategy the **regional self-government**. It defines the development directions, and **coordinates and organizes the strategy implementation process**, ensuring in particular the implementation of the development objectives defined in article 11 sections 1 and 2 of the Act on Regional Self-Government dated 5 June 1998.[238] The regional self-government **initiates development activities**, and **creates conditions** for the implementation of the adopted development objectives by providing financing, defining the scope of intervention and preparing an appropriate management structure, which constitutes the basis for the efficient conduct of development processes.

The Self-Government of the Lodzkie Region will implement the objectives defined in the Strategy both **directly** (activities realized within the framework of public tasks by the Marshal's Office of the Lodzkie Region, local government units and companies in which the regional self-government is a stakeholder) and **indirectly** (activities beyond the scope of direct influence of the regional self-government, featuring the self-government of the Lodzkie Region as the initiator, motivator and promoter of activities aimed at implementing the adopted development objectives).

In order to effectively implement the Development Strategy of the Lodzkie Region 2030, it is necessary to cooperate with all the entities that can take actions affecting the region's development. The Strategy will be implemented among others by the **local government units of the Lodzkie Region and their partner associations, business sector units and business environment institutions, business associations, non-governmental organisations, units from the education and research and development sectors, healthcare and social assistance institutions, universities,** Local Action Groups, regional self-governments of other regions, and **all residents of the region**, with all the groups being also the Strategy stakeholders. The development of the Lodzkie Region also hinges upon actions and decisions taken at the national level, therefore a successful implementation of the Strategy's objectives will require effective cooperation with the central administration authorities.

[238] Art. 11.1 The regional self-government shall define the development strategy for the region, taking into account the following objectives in particular:
1) nurturing Polishness and the development and shaping of national, civic, and cultural awareness of the residents, as well as nurturing and developing the local identity;
2) stimulating economic activity;
3) increasing the level of competitiveness and innovation of the region's economy;
4) preserving the values of cultural and natural environment taking into account the needs of future generations;
5) shaping and maintaining spatial order.
2. The regional self-government carries out the regional development policy, which includes:
1) creating the conditions for economic development, including the stimulation of the labour market;
2) maintenance and development of social and technical infrastructure of regional rank;
3) attracting and combining public and private funds to carry out tasks of public interest;
4) supporting and conducting activities to raise the level of education of citizens;
5) rational use of natural resources and shaping the natural environment in accordance with the principle of sustainable development;
6) supporting the development of science and cooperation between science and economy; supporting technological progress and innovation;
7) supporting the development of culture and nurturing cultural heritage and its rational use;
8) promoting the assets and development opportunities of the region;
9) supporting and carrying out activities for social integration and counteracting social exclusion.

The Strategy seeks to establish a culture of partnership and cooperation, and as such it will be oriented at cooperation of residents, institutions and organisations, as well as the establishment of lasting relationships between the entities involved in its implementation. An example of dissemination of benefits arising from the cooperation of local government units is the implementation of the project "Pilotage of the Advisory Support Center."[239] The Ministry of Development Funds and Regional Policy has selected two partnerships from the Lodzkie Region to participate in the pilot program: the "Między Kutnem a Łęczycą" partnership[240] and the "SIERADZKIE+" partnership.[241] The projected effect of the pilot program is to develop a formula for advisory support to local governments in the process of strategic development management. Moreover, the best practices developed by the cooperating local governments will be made available to other communes. Cooperation and partnership are the necessary conditions for an effective implementation of the Strategy, especially in the aspects that extend beyond the competences of the regional self-government. The Self-Government of the Lodzkie Region will also support the activities of other entities involved in the implementation of the Strategy and integrate the entities in the implementation of pro-development activities. One expression of the undertaken cooperation will be the implementation of the Integrated Strategic Projects specified in the Strategy.

Success of the undertaken actions requires openness, constant search for implementation opportunities and broad cooperation with government administration (both local and central), cooperation with other regions, especially with adjacent regions, as well as supra-regional cooperation, both in the national and international dimension (cooperation with international organisations and regions of other countries). Significant support for the Strategy implementation process will be provided by the Regional Territorial Forum, which is an opinion-making and advisory body composed of representatives of local government units of the Lodzkie Region, central government administration, business associations, higher education entities, business environment institutions, non-governmental organisations, and business enterprises.

The effective implementation of the Strategy will also depend on actions taken at other levels of management, especially at the national and European level. Some of the provisioned investments will exert an unquestionable influence on the development of the Lodzkie Region. Of primary importance for the future directions of the region's development is the construction of the Solidarity Transport Hub planned by the central government, to be built in Stanisławów, located between Warsaw and Łódź (Baranów Commune, Masovian Region).

The implementation of the aforementioned investments and their consequences for the region, as well as the ten-year perspective of the Strategy, render the development policy shaped by the Self-Government of the Lodzkie Region flexible and open, allowing for the adoption of different scenarios, depending on the decisions and the pace of their adoption at the central level.

Principles of Strategy implementation

The Regional Self-Government of the Lodzkie Region is responsible for organizing and conducting activities that determine the implementation of the adopted regional development policy. To ensure the highest efficiency of the conducted activities, it is necessary to operate according to selected principles that define and organize the entire process of programming and implementation of the Strategy, and regulate the conduct and areas of cooperation of all entities/stakeholders involved in the process.

Universal principles:

- **autonomy -** understood as the right of the regional self-government to independently determine the development policy objectives resulting from internal needs and region-specific potentials,

[239] The project "Pilotage of the Advisory Support Center" is implemented by the Association of Polish Cities on behalf of the Ministry of Development Funds and Regional Policy. https://www.gov.pl/web/fundusze-regiony/centrum-wsparcia-doradczego

[240] The "Między Kutnem a Łęczycą" partnership consists of 21 local government units, including the districts: Łęczycki and Kutnowski , and all communes located in these districts.

[241] The "SIERADZKIE+" partnership consists of 10 local government units, including the Sieradzki district and the following communes: Burzenin Commune, Złoczew Commune, Klonowa Commune, Brąszewice Commune, Brzeźnio Commune, Wróblew Commune, Błaszki Commune, the City and Commune of Warta, and the Goszczanów Commune.

- **superiority -** the Strategy constitutes a document superior to other strategic documents at the regional level, and implies the need to ensure consistency of all types of documents of strategic nature developed at the regional level,
- **cooperation and partnership -** the Strategy projects the strengthening of cooperation of all the entities involved in its implementation, including the local government units of the Lodzkie Region, local governments of other regions, central government administration, business sector and business environment institutions, business and professional self-governments, non-governmental organisations and the inhabitants of the region, educational and R&D entities, international organisations and regional authorities of other countries. In addition, this principle seeks to establish a culture of partnership and cooperation, which will be oriented towards the cooperation of people, institutions and organisations, and the establishment of lasting relationships between the respective entities implementing the Strategy. This principle is also understood as the participation, co-determination and co-responsibility of entities in the creation of the region's development policy and implementation of the objectives of the Strategy. Cooperation and partnership are the necessary conditions for the success of the implementation of the Strategy, since some of the activities lie beyond the scope of competences of the Self-Government of the Lodzkie Region.

Principles for development planning:

- **coherence** is a principle that accounts for the objectives included in strategic documents at the European and national level in the process of development of the Strategy. Special attention is placed on the consistency of the Strategy with the directions set out in the Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030), the National Strategy for Regional Development 2030, and the thematic objectives of the European Union's cohesion policy. **demographically conditioned development** refers to targeting interventions under individual public policies, taking into account the current demographic trends. The implementation of development policy seeks to enable the reduction of the scope of adverse demographic changes.
- **integrated planning** involves a multidimensional integration of planning and implementation of the development policy of the Lodzkie Region, combining social, economic and spatial dimensions while maintaining sustainable development. The projected intervention should be tailored to the specificity of a given area, respond to its particular needs, and be grounded in the internal development potential of the area. An integrated territorial approach addresses the need to correlate the development policy in its socio-economic and spatial dimensions at the regional level, so that they form a coherent system of planning the development of the region. It is important to take into account the territorial context at the stage of programming, implementation and monitoring of activities. This principle also implies the complementarity of actions taken at different levels of administrative division.
- **selectivity** refers to the concentration of integrated and complementary actions leading to the achievement of selected strategic objectives for the development of the region, the support of specific social groups and development of designated areas of intervention. The principle of selectivity assumes a strategic choice regarding the directions of regional development in cooperation with all partners involved in its implementation. This principle also entails supporting those industries, fields, sectors and niches which - thanks to their potential - allow for the creation of a tangible competitive advantage of a given area on a regional, national or international scale and are the driving force for economic development.

Principles for implementation:

- **sustainable development** provisions to carry out activities aimed at improving the living standards of the residents while ensuring the balance between social, economic, spatial and environmental aspects of the developing market economy. The principle promotes development based on efficient resource management and innovative solutions taking into account the challenges of climate policy.

- **multi-level management and integrated projects** principle envisions coordinated actions and the creation of development investments implemented by various entities (local government units, business entities and social partners), financed from various sources to ensure their complementarity. The implementation of integrated projects will ensure the effectiveness of financial support, synergy and greater benefits for the development of the region than in the case of point actions. This principle takes into account the involvement of social and economic partners in the decision-making and implementation processes.

Financial framework and tools for Strategy implementation

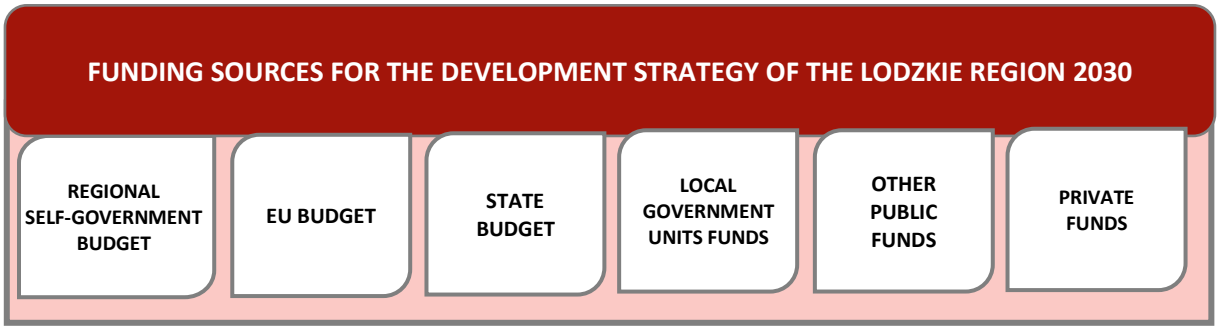
For effective implementation of the Strategy, the Self-Government of the Lodzkie Region will seek all available sources, tools, methods and opportunities for the implementation of specific objectives in order to realize the vision proposed in the document.

On account of the ten-year time horizon of the Strategy, the **financial framework** has been determined in a **directional manner** by indicating the potential **sources of financing** and specifying **the implementation tools and reconciliation mechanisms** adopted under the Development Strategy of the Lodzkie Region 2030. For the effective implementation of a wide range of planned intervention, the financing system of the Strategy will be based on the principle of assembly of financial resources from various sources using a variety of support tools.

Essential or the financing of the Strategy is the **catalogue of public resources**, including:

- funds from the budget of the Lodzkie Region;
- funds from the budget of the European Union;[242]
- funds from the state budget;
- funds contributed by local government units;
- other public funds.

Also important in the financing of development interventions are **private funds** that can be used to co-finance projects implemented under the operational programs or under the **public-private partnership** formula. Direct initiatives of the private sector, in particular business entrepreneurs, which will translate especially into the increase of the economic potential of the region, will also constitute a significant element of the Strategy implementation.



The funds from the budget of the Lodzkie Region will finance the development expenses directly or subsidize the development expenses financed from other sources.

The financial condition of all entities implementing the Strategy will also affect the possibility of absorption of funds from other sources, primarily EU funds.

Some of the aforementioned resources will be used directly to implement the Strategy, others will be allocated to a variety of **implementation tools**. In the following section of this chapter, those tools will be indicated whose importance is the greatest in terms of their applicability in the implementation of the objectives of the Strategy, including the implementation of the Integrated Strategic Projects. The tools indicated in this chapter are an open catalogue within which resources from different sources can be combined. One of the supporting instruments will be the **Regional Development Fund for the Lodzkie Region**, whose activities will be focused in

[242] Structural and investment funds available under the various policies of the European Union, in particular under the cohesion policy and the common agricultural policy, as well as funds available under other support tools and instruments allocated at the European level.

particular on financing investments of the SME sector and other objectives resulting from the development programs adopted for the region.

According to the draft general regulation dated 29 May 2018 and the draft Partnership Agreement (January 2021), support under the cohesion policy will focus on a limited number of objectives.[243]

The most important tool for the region under the cohesion policy will be the **regional program**, which is planned to be implemented in the years 2021-2027. Developed, managed and implemented by the Board of the Lodzkie Region, in accordance with the Act on the Principles of Development Policy, the regional program will address the development challenges identified in the Development Strategy of the Lodzkie Region 2030, supporting the objectives and planned measures set out therein. According to the draft Partnership Agreement,[244] the value of funds under the regional program will amount to EUR 1.631 billion.[245] In addition, the region will have the opportunity to negotiate additional funds[246] for strategic interventions under a programming contract to be concluded between the regional self-government and the minister responsible for regional development.

Other tools that the Lodzkie Region will use to implement the Strategy will be the **national programs**. The scope of their intervention will follow from the objectives defined in the EU regulations, as well as the needs and investments important for the economy and development of Poland defined in strategic documents, especially the Strategy for Responsible Development, National Strategy of Regional Development 2030 and integrated sectoral strategies, while also maintaining the established demarcation of support between the national and regional levels. Under this assumption, the national programs will support those objectives of the Strategy that align with those of their own.

In the context of mitigating the economic crisis related to COVID-19 and its consequences, the **European Instrument for Reconstruction (Next Generation EU)** will be a particularly important tool for the Lodzkie Region in the implementation of the Strategy. Its most important element will be the **Reconstruction and Resilience Facility** (RRF). Within this instrument, the planned budget for Poland will amount to EUR 57.3 billion in the form of loans and grants to support reforms and investments undertaken by the EU member states.

The **Just Transition Mechanism**, which is an element of the investment plan for the European Green Deal, will be a helpful instrument for the Lodzkie Region in implementing the activities indicated in the Strategy and related to "green transformation" and minimizing its adverse effects. According to the draft Partnership Agreement (January 2021), the Lodzkie Region is one of six regions[247] that are eligible to apply for funds for a transition towards a climate-neutral economy.

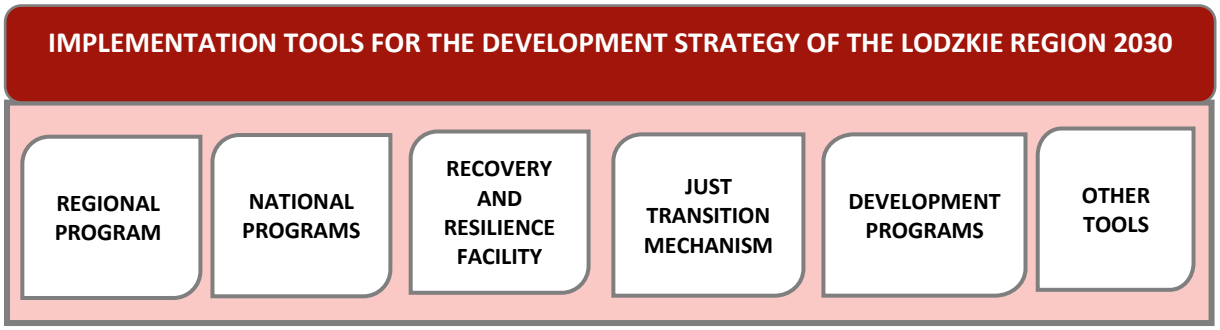
In the financial perspective 2021-2027, the regional programs also provide for territorial instruments, which aim to strengthen the cooperation and partnerships of local governments implementing joint development activities in accordance with their respective territorial strategies. The draft Partnership Agreement provides for the use of three instruments: Integrated Territorial Investments (ITI), another territorial tool (ATT) and Local Development Directed by Society (LDDS). The instrument that will be used to support the Functional Urban Areas (FUA) identified in the Strategy will be Integrated Territorial Investments (ITI). Final decisions on the principles and scope of functioning of the ITI and the amount of allocated funds, as well as the use of other territorial instruments at the regional level will be made during the work on the regional program.

The implementation of the Strategy will also harness the **programs managed directly by the European Commission,**[248] along with the tools using the resources of the European Investment Bank and other **international financial institutions**, as well as the Norwegian Financial Mechanism and the Financial Mechanism of the European Economic Area.

[243] See the European Union Cohesion Policy 2021-2027 (introductory chapter).
[244] Draft Partnership Agreement - January 2021.
[245] At fixed prices set in 2018.
[246] According to the draft Partnership Agreement (January 2021), the total value of the funds remaining to be negotiated under program contracts amounts to EUR 7.105 billion.
[247] According to the draft Partnership Agreement, six regions (Śląskie, Łódzkie, Małopolskie, Lubelskie, Dolnośląskie and Wielkopolskie) will receive €4.4 billion from the Just Transition Fund and cohesion policy (€3.8 billion from the STF and €560 million from the cohesion policy, respectively).
[248] Among others: CEF Mobility (Connecting Europe), Horizon Europe, Digital Europe, Invest EU, Creative Europe, EURATOM, LIFE, COSME.

Given the reduction of support under the cohesion policy in the financial perspective 2021-2027, national sources of financing will become increasingly important for the implementation of the Development Strategy of the Lodzkie Region 2030. Regional policy will be implemented within the framework of **national development programs**,[249] including long-term programs, as well as other **instruments based on public funds**.[250]

It will also be possible to use the professional system of development institutions[251] through the instruments offered by the Polish Development Fund Group. These include instruments for local government development (e.g. infrastructure financing, public-private partnership) and enterprise development (e.g. development capital, bank guarantees or consulting and export financing).



In order to adapt the intervention to specific regional needs, taking into account the provisions of the Strategy for Responsible Development as well as integrated sectoral strategies, and in order to make optimal use of the financial resources granted, it is necessary to involve partners from all levels of governance and to make appropriate arrangements with regard to the planned investments. To this end, the NSRD 2030 introduces the main **reconciliation mechanisms** that will help optimize the cooperation between the local, regional and national levels, including the program contract, sectoral contract, and territorial agreements.

Within the framework of the **program contract**, agreements will be made between the government party and the regional self-government, which will oblige the parties to implement the tasks defined in the regional program, aimed at achieving common goals in a given territory. The program contract shall specify the principles, directions and conditions of financing the regional program, along with the priority projects for the Lodzkie Region to be implemented using regional funds. In some areas, it will also be possible to determine the undertakings to be implemented under national programs in a non-competition procedure.

The mechanism coordinating the implementation of regional projects financed from the state budget funds will be a **sectoral contract**, i.e. a territorially oriented regional intervention in individual development programs devised by the relevant ministries. The sectoral contract will indicate projects earmarked for implementation both on the part of the government and the regional self-government, provided that the regional self-government guarantees a financial contribution to their implementation.

A new type of reconciliation mechanism is the **territorial agreement**. This mechanism can be used by the Self-Government of the Lodzkie Region and the local authorities to more efficiently negotiate the scope of projects, objectives and activities in the region required for the successful implementation of the Strategy. The mechanism assumes the cooperation of local governments in the areas where significant potentials for or barriers to development opportunities were identified. It defines the scope and method of implementation of projects that

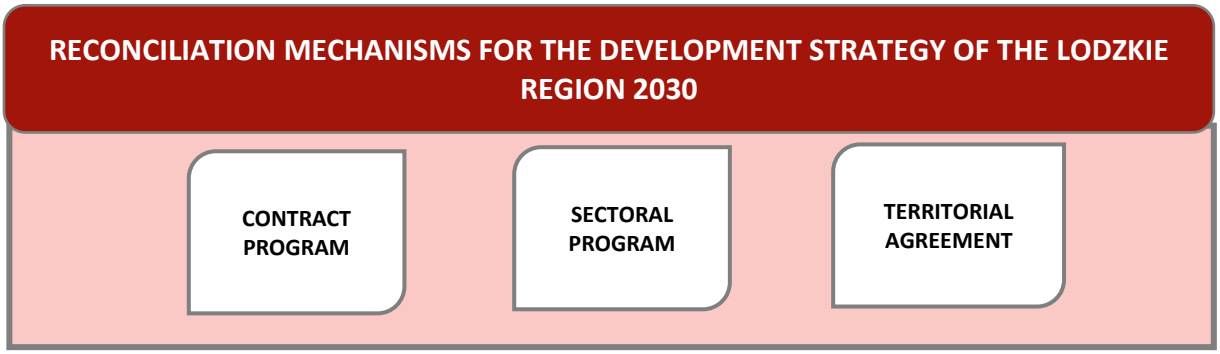
[249] Among others: National Railway Program, National Roads Construction Program for 2014-2023 (with an outlook to 2025), National Program for Combating Cancer for 2016-2024, Program for supporting investments of significant importance for the Polish economy for 2011-2023, and other programs to be developed at the national level.

[250] Among others: National Environmental Protection and Water Management Fund, Regional Environmental Protection and Water Management Fund, Local Government Road Fund, National Road Fund, Railway Fund.

[251] Introduced by the System of Development Institutions Act dated 4 July 2019. The System of Development Institutions (Polish Development Fund Group) consists of the following:
1) Polish Development Fund,
2) Bank Gospodarstwa Krajowego,
3) Polish Agency for Enterprise Development,
4) Korporacja Ubezpieczeń Kredytów Eksportowych Spółka Akcyjna,
5) Polish Investment and Trade Agency Joint Stock Company
6) Industrial Development Agency Joint Stock Company.

are important for the area covered by the agreement and translocal development. It can also serve to support local authorities from the Lodzkie Region or other regions with funds allocated at the national level.

The above reconciliation mechanisms are detailed in the Act on the Principles of Development Policy dated 6 December 2006.



The development of the Lodzkie Region is a complex process that requires efficient organisation of an entire implementation system, therefore the Self-Government of the Lodzkie Region will actively seek opportunities to use the aforementioned implementation tools and mechanisms to achieve the respective Strategy 2030 objectives.

As the most important document defining the development policy and challenges facing the region, the Development Strategy of the Lodzkie Region 2030 establishes the framework for planning processes at the local level; its individual assumptions are reflected in the Spatial Management Plan of the Lodzkie Region. In order to support the effective implementation of the development policy, it is possible to introduce lower-level regional documents, e.g. sectoral strategies, development programs, or implementation plans drafted for selected thematic areas and assessed for their compliance with the strategic objectives.

System of Strategy monitoring and evaluation

The implementation of the Strategy requires continuous scrutiny of the changes taking place in the region, as well as responding to the emerging problems and threats to the achievement of the results envisaged by the strategy; as such, the Strategy will be subject to ongoing monitoring. The thematic scope of monitoring and evaluation of the implementation of the Strategy is determined by its strategic and operational objectives. The basic point of reference for monitoring the Strategy implementation is the set of indicators listing the projected results of the Strategy implementation related to specific strategic and operational objectives.

The monitoring process of the Strategy will be conducted on a running basis, which will involve continuous collection of statistical data, information on the implementation of Integrated Strategic Projects, data on the financial resources involved in the implementation of the Strategy, and conducting the required supplementary analyses, e.g. in the scope of analysis of innovation diffusion bottlenecks. The main document for periodical summaries of the monitoring process will be the Report on the Implementation of Strategy 2030, submitted for approval to the Board of the Lodzkie Region. The report will be drafted at least every two years and will consist of an evaluation of the level of implementation of the Strategy's objectives, evaluation of the socio-economic and spatial condition of the region, and conclusions and recommendations regarding the implementation of the Strategy. The conducted monitoring activities will provide the basis for the evaluation of the degree and dynamics of progress in the implementation of the strategic and operational objectives of the Strategy.

The part devoted to the evaluation of the degree of implementation of the respective strategic objectives will be measured using the indicators from the Strategy's monitoring system. It will also contain aggregate information on:

- projects co-financed by the European Union;
- status of implementation of the Integrated Strategic Projects;
- actions taken by the Self-Government of the Lodzkie Region and local government units in the Areas of Strategic Intervention;
- other regional and national investments carried out in the region as part of the operational objectives.

The part devoted to the **evaluation of the socio-economic and spatial situation** of the region will include analyses of economic and social indicators corresponding to the strategic and operational objectives, and synthetic information on the state of progress of planning documents[252] drafted by local governments.

The main entity responsible for conducting the process of monitoring the implementation of the Development Strategy of the Lodzkie Region 2030 is the Board of the Lodzkie Region, which will perform the aforementioned task through its subordinate units: the Departments of the Marshal's Office of the Lodzkie Region, the Spatial Planning Office of the Lodzkie Region, and the relevant units and institutions responsible for the Strategy implementation. The unit responsible for monitoring and compiling reports on the implementation of the Strategy is the Regional Territorial Observatory, operating within the structure of the Spatial Planning Office of the Lodzkie Region in Łódź.

The **evaluation process** is an assessment of the effectiveness of actions, financial instruments, usefulness, relevance, sustainability and complementarity of the interventions performed under the Strategy. Together with cyclical monitoring reports, the evaluation process is envisioned as part of the decision-making process and evidence-based development policy carried out by the Board of the Region.

The Strategy will be evaluated according to the following schedule:

- ex-ante evaluation, to which the draft Strategy has been subjected,[253]
- on-going evaluation will be carried out in the middle of the implementation period of the Strategy,
- ex-post evaluation will be carried out after the completion of the implementation of the Strategy.

[252] Applies to the study of the conditions and directions of spatial management planning and the local spatial management plan.
[253] Ex-ante evaluation of the Draft of the Development Strategy of the Lodzkie Region 2030, Infondo, 2020; https://rot-lodzkie.pl/artykul/177

Table 1. Indicators for monitoring the Strategy.

Item no.	Name of indicator	Base year value for the Lodzkie Region	Position in the country	Base year value for Poland/Polish average	Target value for the region in 2030	Source of data
1. ECONOMIC SPHERE – STRATEGIC OBJECTIVE: MODERN AND COMPETITIVE ECONOMY						
Strategic objective 1.1. Increasing research and innovation potential						
1.	Internal expenditures on R&D in relation to GDP (current prices) [%]	0.94% (2018)	7.	1.21% (2018)	national average	STATISTICS POLAND
2.	Average share of innovative enterprises in the total number of enterprises [%]	14.8% (2019)	8.	15.5% (2019)	national average	STATISTICS POLAND
Strategic objective 1.2. Improving the quality of human capital						
3.	Labour force participation rate for persons in working age [%]	78.9% (2019)	5.	77.1% (2019)	82.0%	STATISTICS POLAND
4.	Percentage of adults aged 25-64 participating in education or training	3.0% (2019)	14.	4.8% (2019)	above national average	STATISTICS POLAND
Strategic objective 1.3. Supporting the development of small and medium enterprises						
5.	Entities entered in the REGON register per 10,000 population	1,036 (2019)	10.	1,175 (2019)	1,165	STATISTICS POLAND
6.	Entities with foreign capital participation per 10,000 population	3.8 (2019)	10.	6.6 (2019)	4.5	STATISTICS POLAND
Strategic objective 1.4. Development of the agricultural sector and its competitiveness						
7.	Global agricultural production per 1 ha of agricultural land according to new definition [in PLN].	PLN 8,605 (2019)	4.	PLN 7,883 (2019)	PLN 10,000	STATISTICS POLAND
8.	Average area of agricultural land in a holding [in ha]	7,98 ha (2020)	13.	11,04 ha (2020)	8.60 ha	AGENCY FOR RESTRUCTURING AND MODERNISATION OF AGRICULTURE
2. SOCIAL SPHERE – STRATEGIC OBJECTIVE: CIVIC SOCIETY OF EQUAL OPPORTUNITIES						
Strategic objective 2.1. Development of social capital						
9.	Number of foundations, associations and social organisations per 10,000 population	35.3 (2019)	14.	38.3 (2019)	national average	Own calculations based on STATISTICS POLAND
10.	Number of participants in events organized by cultural centers, clubs, community centers per 1,000 population	657 (2019)	16.	977 (2019)	national average	STATISTICS POLAND
Strategic objective 2.2. Improving population health						
11.	Average male/female life expectancy	72.5/81.0 (2019)	16. 15.	74.1/81.8 (2019)	national average	STATISTICS POLAND
12.	Ward beds in hospices, chronic medical care and nursing homes per 100,000 population	89.3 (2019)	9.	96.3 (2019)	above national average	STATISTICS POLAND
Strategic objective 2.3. Reducing poverty and social exclusion						
13.	Number of persons covered by care services per 1,000 persons aged 65 and over	14.6 (2019)	data not available	data not available	20.0	Own calculations based on REGIONAL CENTER OF SOCIAL POLICY and STATISTICS POLAND
14.	Number of persons using social assistance benefits per 10,000 population	312.7 (2019)	10.	314.0 (2019)	250	STATISTICS POLAND
15.	Percentage of dwellings equipped with basic utilities (bathroom) - urban/rural areas	90.5% – urban areas 75.2% – rural areas (2019)	16. 13.	95.7% – urban areas 83.3% – rural areas (2019)	99% – urban areas 95% – rural areas	STATISTICS POLAND
3. SPATIAL SPHERE – STRATEGIC OBJECTIVE: ATTRACTIVE AND ACCESSIBLE SPACE						
Strategic objective 3.1. Adaptating to climate change and improving the quality of environmental resources						
16.	Share of urban green areas in the total urban area [%][254]	5.97% (2019)	5.	4.77% (2019)	more than in the base year	Own calculations based on STATISTICS POLAND
17.	PM10 exceedance area [in km2]	501 (2019)	data not available	data not available	less than in the base year	CHIEF INSPECTORATE OF ENVIRONMENTAL PROTECTION
18.	Benzo(a)pyrene target level exceedance area [in km2]	2,238 (2019)	data not available	data not available	less than in the base year	CHIEF INSPECTORATE OF ENVIRONMENTAL PROTECTION
19.	Emission of gaseous pollutants from particularly burdensome industrial plants [thousand t/year].	38,212.6 (2019)	1.	198,440.7 (2019)	less than in the base year	STATISTICS POLAND
20.	Beneficiaries of sewerage network in % of the total population in rural areas	26.4 (2019)	14.	42.2 (2019)	national average	STATISTICS POLAND
21.	Forest cover [%]	21.5 (2019)	16.	29.6 (2019)	more than in the base year	STATISTICS POLAND

[254] The indicator takes into account the share of green areas such as parks, greens, residential green areas, street greenery, cemeteries, and communal forests in the total urban area.

Item no.	Name of indicator	Base year value for the Lodzkie Region	Position in the country	Base year value for Poland/Polish average	Target value for the region in 2030	Source of data
22.	Total capacity of small retention facilities [dam^3]	19,251.0 (2019)	8.	839,607.4 (2019)	more than in the base year	STATISTICS POLAND
Strategic objective 3.2 Protecting and shaping landscape						
23.	Number of objects listed in the register of immovable monuments in the Lodzkie Region (including the number of entries and deletions) [in units].	2,551 (2018 r.)	Data not available	Data not available	No less than in the base year	Own calculations based on NATIONAL INSPECTORATE OF CULTURAL HERITAGE and REGIONAL MONUMENT RESTORER
24.	Share of legally protected areas in the total area of the region [%].	19.5 (2019)	15.	32.3 (2019)	29.0	STATISTICS POLAND
Strategic objective 3.3. Increased transport accessibility						
25.	Density of the motorways and expressway network in the region [km/1,000 km2].	24.7 (2019)	2.	13.1 (2019)	33.4	STATISTICS POLAND
26.	Total railway lines per 100 km2 in the Lodzkie Region	5.9 km/km^2 (2019)	10.	6.2 km/km^2 (2019)	7.1 km/km^2	STATISTICS POLAND
27.	Share of the public transport fleet adapted to the carriage of persons with disabilities in the total fleet [%]	55.5 (2019)	16.	80.5 (2019)	national average	Own calculations based on STATISTICS POLAND
28.	Volume of cargo handled at intermodal terminals (TEU)	494,129 (2019)	data not available	data not available	more than in the base year	Own study based on data from terminal operators
Strategic objective 3.4. Modern energy sector in the Lodzkie Region						
29.	Share of renewable energy in total electricity generated [%]	5.4 (2019)	13.	15.5 (2019)	national average	STATISTICS POLAND
30.	Beneficiaries of the gas distribution network as % of the total population	39.6 (2019)	14.	52.9 (2019)	national average	STATISTICS POLAND
Strategic objective 3.5. Rationalisation of waste management						
31.	Communal waste collected selectively in relation to the total communal waste collected annually [%].	32.6 (2019)	5.	31.2 (2019)	65.0	STATISTICS POLAND
Strategic objective 3.6. Increased accessibility of ICT services						
32.	Share of households equipped with a device with access to the Internet in the total number of households [%].	78.2 (2019)	11.	80.2 (2019)	100	STATISTICS POLAND
HORIZONTAL OBJECTIVE: EFFICIENT AND RESPONSIBLE REGIONAL MANAGEMENT						
33.	Share of area included in spatial management plans in the total area of the region [%]	33.0 (2019)	7.	31.2 (2019)	50	STATISTICS POLAND

IX. SUPPLEMENTS

Table of illustrations

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Spatial Planning Office
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