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Editors
Recep EFE
İsa CÜREBAL
László LÉVAI

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## International Scientific Advisory Committee

# Kazakhstan in the New Economic Zone of The Silk Road

Sharipjan M. NADYROV[1]

**Abstract**

The article deals with the problem of determining the place and role of Kazakhstan in the system of the new *The Silk Road Economic Belt (SREB)* and its impact on regional reconstruction of the economy spatial organization and the formation of logistics centers. It is emphasized that the communications and transport infrastructure is the weakest part of the Kazakhstan economy, and in conjunction with a number of geographical factors, such as the non-compactness of territory that reduces the economic efficiency indicators in all territorial-production complex. Taking into account the evolving situation in the world, the SREB project, if its implemented, may increase competition between Chinese, Western and Russian companies presented in Kazakhstan. It is possible to put Kazakhstan in a situation where it will have to choose the direction of socio-economic and environmental development of combining the interests of Kazakhstan and key partners by SREB or go against the economic interests of Kazakhstan in favor of political and aspirations geostrategic leading geopolitical players in the region. For this reason, the policy of Kazakhstan in respect of SREB should be determined by a special, flexible approach that is seen in the gradual implementation of the integration principle of Kazakhstan into the global innovative technological chain with the maximum efficiency of natural resources, which is most important conditions for the functioning of SREB, and also taking into account the Kazakhstan economic security. In the article describes the necessity of creating a new paradigm of Kazakhstan social - economic development, which should provide economic security and to be an adequate solution to the difficult task of forming the SREB on the base to appropriate strategies.

**Key Words:** The new project of Silk Road Ecomonic Belt, transport and logistics center, competition, economic security, paradigm.

## INTRODUCTION

Currently it requires special study spatio-temporal nature in Central Asia, Russia and Europe to evaluate the role of a SREB in the global economy. Chinese scientists are of the opinion that SREB for China is more important than the Great Silk Road in past epochs. It is difficult to disagree. The SREB project authors represent unique and natural continuation of the reform of the Chinese outside of China, especially in Eurasia. It is confirmed that this huge project will be included in the plan, "the 13th Five-Year Plan", which will be adopted in 2016 [1]. All this testifies to a sharp increase the role and status of China in the Eurasian economic framework aimed at full-fledged global leadership in the global economy.

Currently, the quantitative and qualitative parameters of the Chinese economy has reached such proportions that its spatial development goes far beyond the borders of China. The SREB playing is definitely a positive role for the international community, will serve the interests mainly of China, if not in the twenty-first, the XXII century. At the same time, Kazakhstan is a key country in the SREB project.

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As the President Nursultan Nazarbayev, the core of the new economic policy of Kazakhstan is the development of infrastructure, Implementation of projects under "Nurly Zhol" is aimed primarily at ensuring the infrastructural foundations for economic growth. New Economic Policy "Nurly Zhol" will be the engine of our economic growth in the coming years. Only 200 thousand new jobs will be created due to road construction. This means employment and income growth. "Nurly Zhol" will produce a multiplier effect on other sectors of the economy: the production of cement, metal, machinery, bitumen, equipment and related services. Roads - a life line for Kazakhstan. Our vast expanses around the road is always a life evolved. We must create a transport network to Astana from all sides diverged road, rail and air lines. As from the heart - artery. As the sun - rays [2].

Moreover, the Chinese leadership has in 2016 is going to devote a lot of money to create an economic corridor of the Silk Road. Thus, the project will be financed from the newly established Asian Infrastructure Investment Bank (AIIB) with a registered capital of $50 billion. And the total assets of $100 billion, as well as from the Silk Road Fund amount to $40 billion. CEO of AIIB Jin Liqun stressed the bank's readiness to solve complex infrastructure problems that exist in Asia [3]. Starting the AIIB will help the development of the structure of the world economy, will make the system of global economic governance more equitable, Hu said. Of course, these problems are of exceptional relevance to the world economy.

Based on this objective of the study is to assess the impact of SREB project on the processes of the spatial organization of the territory in the Kazakhstan regions, from the standpoint of economic, environmental and town-planning effect.

For attainment goal the following tasks:

The necessity of developing the mechanism of protection against the negative influence of anthropogenic factors on territory of Almaty, Zhambyl, South Kazakhstan, Kyzylorda, West Kazakhstan, North Kazakhstan, Akmola and Karaganda regions;

The necessity of integration of the Republic of Kazakhstan into the global innovative technological chain;

The necessity of creating a new paradigm of social - economic development of Kazakhstan, capable of ensuring the economic security and to be an adequate solution to the difficult task of forming the SREB.

**Study area:** District research is the Kazakh section of SREB. Creation and organization of a balanced environmental management and sustainable development of natural-economic zone of the SREB require an integrated geographical approach and effective research, monitoring and control of the spatial and temporal parameters of the natural and economic subsystems.

The Kazakhstan is a key country in the SREB and its arid regions will experience a corresponding burden on the natural and economic system (NES), which will lead to the need for a mechanism to protect against the negative influence of anthropogenic factors. With high probability NES of Ili-Balkhash region, Almaty region, NES of Zhambyl region, the basin of the Syrdarya river and the Urals, South Kazakhstan, Kyzylorda, West Kazakhstan regions, as well as areas of North Kazakhstan, Akmola and Karaganda regions may be areas large landscape -environmental transformation and affect the stability of the NES, in particular, their socio-economic and landscape-environmental subsystems.

Of course, communication and transport infrastructure is the weakest part of the Kazakh

economy, which in combination with a number of geographical factors, such as non-compactness of the territory as a whole reduced indicators of economic efficiency of the entire territorial-production complex. However, the worrisome fact that the trade and economic ties China's major partners by SREB Russia and Kazakhstan are mainly based on quantitative indicators, i.e. at the figures - the volume of production and export of oil, gas, non-ferrous metals and other resources. While China's economic relations with the United States, the EU is mainly tied to the innovative technologies, and it is a fundamental difference.


*Figure 1. Areas of SREB route*

**Material:** We used

- the reporting materials JSC "Economic Research Institute" of the Ministry of Economy and Budget Planning of the Republic of Kazakhstan for the project "Study of prerequisites for the development of economic potential of the regions and the settlement of the Republic of Kazakhstan population" in 2008,
- a monograph in three volumes prepared on the basis of this report on the topic: «The spatial organization of the territory and the resettlement of the population of the Republic of Kazakhstan till 2030»,
- as well as the project of the fundamental research program on the topic: "Kazakhstan in the system of new geopolitical and regional transformations in Central Asia" and the eponymous monograph published in Almaty in 2015
- statistical material, articles of Kazakhstani and foreign authors.

**Methods:** The basis of the study served as the methodology of national and foreign geographical science. The study used comparative methods, mapping and systematic structural analysis.

**RESULTS**

The result of this study is the basis for a new paradigm of social - economic development of Kazakhstan, which should provide economic security and to be an adequate solution to the difficult task of forming the SREB and on its basis should be developed:

• Strategy of socio-economic development with the appropriate mechanisms of transition to the new technological order.

• spatial development scheme with Kazakhstan accentuation attention to the reconfiguration of territories of cities and regions as the town planning basis for the functioning of the national economy.

• the population of the settlement system and the formation of urban agglomerations - incubators of innovative technologies and financial centers of the world, sub-regional and regional levels, affecting a significant part of the SREB and the Eurasian Economic Union.

**Discussions.** The collapse of the stock market in China, especially in the summer of 2015 showed the vulnerability of China's economic and financial system and its high dependence on the economy of post-industrial states. Although in this case, it involved a great policy that reflects the interests of China to other countries. The main purpose of SREB not only the formation of a new framework of the global economy in the eastern hemisphere, under the auspices of China, but mainly technological and trade and economic relations with the countries of Western Europe. The entire transport and logistics system of Kazakhstan, Russia and other countries will have to serve transit with the biggest scale and scope in the world economic relations.

Thus, the process linked to the railway lines Zhetegen - Khorgos and Zhezkazgan - Beyneu, road corridor Western Europe - Western China and the Aktau port and FEZ "Khorgos - Eastern Gate" is an important center for the consolidation and distribution of cargo flows on the new Silk Road, and provides further integration of Kazakhstan global transportation and trade system. The favorable geographical location and FEZ "Khorgos - Eastern Gate" at the intersection of important routes from China and Southeast Asia, the CIS countries, as well as in Europe, the Persian Gulf and other regions and the presence of conditions for the development of multimodal logistics, large-scale industrial production and trade allow it to become a world-level perspective of distribution center [4].

***Table 1.*** *Proportion of technological structure in some economies (estimate) [6,7]*

| Country | III techno mode | IY techno mode | Y techno mode | YI techno mode |
|---|---|---|---|---|
| USA | - | 20 % | 60 % | 5 % |
| Russia | 30% | 50% | 10% | - |
| Kazakhstan | 65 % | 34 % | 1 % | |

The SREB project authors representing likely or as much space as the tools of spatial development and management. However legitimate this project, in our opinion, be regarded as one of the most important elements balanced Chinese economy and increase its stability in the system relations. In most Chinese documents [5] declared the common position of the significance of the SREB in the transit of goods between Europe and Asia, and highlights the key role of Kazakhstan. However, no binding to specific geographical features, like large objects of mining, energy, chemical industry of Kazakhstan. The role of the Silk Road in the process of integration of Kazakhstan into the global technology links remains open. The

obstacle in this case is the technological gap due to the predominance of production of the 3rd and 4th technological structure.

To embed the Republic of Kazakhstan into the global innovative technological chain, the Kazakhstan economy needs a qualitative leap in the development of the productive forces, the formation of new industries, which improved the forms and methods of management, that is, the need to transform the technological structure. The lag in the innovative development of Kazakhstan is also related to the lack of systematic legal and regulatory framework governing the scientific sector. Comparative analysis of scientific and technological activities in Kazakhstan and developed countries has shown that the development of national support systems, and innovation in the country is in its infancy. Kazakhstan was only at the initial stage of economic transition from commodity to innovative type of development. The main priorities of the economy, unfortunately, over the years of independence became a category of oil, gas and other strategic raw materials, and SREB can further build on these areas. In the economic literature over the past twenty years has disappeared the notion of "economic efficiency" as unnecessary due to significant inflow of petrodollars. This has led to the neglect to use the majority of economic laws, in particular the principle of outstripping productivity growth compared with the growth of wages, with all consequences. Such laws acting at the level of enterprises and industry in general, are the indicators of competitiveness of the national economy. However, in the formation of the Kazakh section of SREB use of economic laws and principles are main factors of success of Kazakhstan's participation in this project.

The use of the territory of Kazakhstan and other Central Asian countries as transit should promote not only growth, but also the development of their national economies in the context of integration into the global technological chains with a view to moving to the new technological order to reduce the socio-economic gap with the developed countries. There is a situation in which, Kazakhstan possessing a weak scientific and methodological tools of spatial development and management at the beginning of the SREB project can further develop the scenario does not depend on regional and economic interests of the country. It is better for Kazakhstan to create early the appropriate conceptual basis of functioning of the SREB. The same applies to other countries of Central Asia.

In this situation, sustainable development, resource-saving, energy-efficient, high technology, environmentally and socially - oriented areas could determine the structure of the economy and the associated environmental management system in the area of the Silk Road. Profound environmental changes that have occurred in the natural system of the Republic of Kazakhstan along the route of the Silk Road, raise a number of new challenges, including the need to develop the principles of sharing water and energy resources of transboundary rivers, restoration and preservation of landscape diversity. This provision is fundamental to the definition of land use and management of regional planning strategy, the development of environmental and socio-economic development concepts of natural and economic systems (PCT) in the zone of the Silk Road, including natural-security activity and control of the alleged solutions technology.

The specificity of the modern model of Kazakhstan's economy - the high vulnerability to the volatility of the world oil market, as evidenced by the events of the last months of last and the beginning of 2016. Of course, there are many reasons, which at one time were not enough professionally evaluated, although even 200 years ago, Franz Liszt [8] first pointed out the need for a comparison of the market model, with specific historical circumstances, transferring the problems from the scientific sphere of abstractions to specific policies. He

proposed to raise the question as follows: we do not need to solve the "market or non markets" "free trade, or lack of freedom of trade." We have to find out in what way you can develop market relations in the country concerned, so that contact with more developed market in the world without losing the sense of political power, economic and industrial sovereignty, national independence. Friedrich List gave an answer to a question that has long been hesitant of Guidelines of the Customs Union (Russia, Belarus, Kazakhstan). This answer was his famous theory of "autarky large spaces." He rightly considered that the successful development of the economy state and nation should have the maximum possible areas, the combined total economic sovereignty (for this purpose, he proposed to unite Austria, Germany and Prussia into a single "customs union", within which will be intensively developed integration processes and market relations). However, he insisted that domestic freedom of trade restrictions within the Union have been minimal or even canceled.

Of course, SREB project is unique because virtually integrates much of the Eastern Hemisphere on the principles of the formation of a new financial and economic system and has no precedent in recent global economic history. Another thing is how much the country - member of SREB except China and Russia are ready to implement this project. We are talking about the possibilities to defend its own interests in the competition due to the advantages of spatial, technological, scientific and educational development in the emerging system of economic relations. In the process of economic integration SREB countries must achieve higher quality indicators of reproductive structures in comparison with Russia and China. One can not ignore the positive side of SREB and each of them deserves serious research, but in any educational integration success depends on the country or countries of integrators, which may be no more than 2 or 3.

In these circumstances, to increase the stability of the socio-economic system of Kazakhstan requires a new paradigm of social - economic development of the adequate solution of difficult problems of formation of SREB. On the basis of such a paradigm should be developed:

- Strategy of socio-economic development with the appropriate mechanisms of transition to the new technological order.
- Schemes of spatial development of Kazakhstan with accentuation attention to the reconfiguration of territories of cities and regions as the town planning basis for the functioning of the national economy.
- The population of the settlement system and the formation of urban agglomerations - incubators of innovative technologies and financial centers of the world, sub-regional and regional levels.
- Integration mechanisms in the global innovative technological chain.

**CONCLUSIONS**

Taking into account the evolving situation in the world, the SREB project is a new economic zone, provided that its implementation may increase competition between Chinese, Western and Russian companies present in Kazakhstan. It is possible to put Kazakhstan in a situation where it will have to choose the direction of socio-economic and environmental development of combining the interests of Kazakhstan and SREB key partners or go against the economic interests of Kazakhstan in favor of political and aspirations geostrategic leading geopolitical players in the region. For this reason, the policy of Kazakhstan in respect of SREB should be determined by a special, flexible approach that

is seen in the gradual implementation of the principle of integration of Kazakhstan into the global innovative technological chain at the maximum efficiency of natural resources, the most important conditions for the functioning of SREB, taking into account the economic security of Kazakhstan.

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# Around the Revitalisation of Post-Industrial Urban Spaces – Case Study: Metropolitan Association of Upper Silesia

Marta CHMIELEWSKA[1], Sławomir SITEK[2], Elżbieta ZUZAŃSKA-ŻYŚKO[3]

**Abstract**

Revitalisation is a complex, long-lasting and interdisciplinary process, aimed at social and economic recovery of the degraded part of the town, which includes comprehensive changes in spatial, functional, urban, infrastructural, social and environmental structure of the urban space. A special type of degraded spaces, particularly inconvenient to revitalise, are post-industrial spaces, characterized by the loss of hitherto function and the exclusion from use. The paper concerns issues connected to the revitalisation of post-industrial urban spaces of the Metropolitan Association of Upper Silesia in Poland, one of the largest urban areas in European Union, located in the middle of the area which used to be the biggest industrial region in Poland and one of the biggest industrial regions in Europe, formed as a result of intensive development of heavy industries initiated in the 18th century by industrial revolution, known from its hard coal mines, iron and steel works, factories as well as from pollution. After the 25 years of economic restructuring in the urban space of towns united in the Metropolitan Association of Upper Silesia there are much fewer industrial facilities and brownfields, a lot of which were successfully revitalised. The paper shows main directions of redevelopment of brownfields in this area in general, as well as characterises most outstanding revitalisation projects implemented there.

**Key Words:** revitalisation, Metropolitan Association of Upper Silesia, post-industrial space

## 1. INTRODUCTION

Post-industrial urban spaces are important components of the landscape of traditional industrial regions which are to find all over the Europe, among others in Great Britain, Germany, Belgium, Poland, Czech Republic and Ukraine. They had been formed as a result of intensive development of heavy industries such as hard coal mining or iron and steel production started in the 18$^{th}$ century by industrial revolution. In the second part of the 20$^{th}$ century due to the introduction of cleaner and cheaper energy sources as well as new technologies traditional branches of industries declined in importance. After a crisis of coal surplus fallowed by a crisis in iron and steel industries many mines, foundries and other industrial plants had to be closed down. Since then traditional industrial regions have been losing their original function and have to deal with many various problems of social and economic background as well as connected with the emergence of brownfields and its revitalisation.

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Revitalisation is a complex, long-lasting and interdisciplinary process, aimed at social and economic recovery of the degraded part of the town, which includes comprehensive changes in spatial, functional, urban, infrastructural, social and environmental structure of the urban space. Revitalisation of former industrial sites is not easy. On the one hand, these places usually take a lot of space, which creates a large range of possibilities for designers to redevelop them. On the other hand, in this space there are specialized buildings and devices, which hinder the introduction of changes. Nevertheless, in most cases, revitalisation of post-industrial objects leads to the succession of function, which is the replacement of its previous industrial usage by other, usually broadly defined service functions. It usually involves also morphological changes of the urban landscape.

The paper focuses on the issue of revitalisation of post-industrial urban spaces of the Metropolitan Association of Upper Silesia. The study area is located in the middle of the biggest former industrial region in Poland previously known from its hard coal mines, iron and steel works, factories as well as from the pollution. The redevelopment of this region has started about 30 years later than in the western Europe – at the beginning of 1990s., along with the transformation of political system of Poland. Nowadays, after the 25 years of economic restructuring of the region a lot have changed. In the urban space there are significantly fewer industrial facilities and brownfields, a lot of which were successfully revitalised.

## 2. STUDY AREA

The Metropolitan Association of Upper Silesia is located in southern Poland, in the Silesia Province (fig.1). It is a polycentric system of 14 cities and towns: Katowice (304,000 inhabitants), Sosnowiec (211,000 inhabitants), Gliwice (185,000 inhabitants), Zabrze (178,000 inhabitants), Bytom (173,000 inhabitants), Ruda Śląska (141,000 inhabitants), Tychy (128,000 inhabitants), Dąbrowa Górnicza (123,000 inhabitants), Chorzów (110,000 inhabitants), Jaworzno (93,000 inhabitants), Mysłowice (75,000 inhabitants), Siemianowice Śląskie (68,000 inhabitants), Piekary (57,000 inhabitants) and Świętochłowice (51,000 inhabitants). The average population density in the entire study area is 1,603 people per square kilometre, and in individual cities and towns it is grossly diversified and oscillates from 623 to 4,154 people per square kilometre (Zuzańska-Żyśko 2016).

The Metropolitan Association of Upper Silesia has been shaped from a conurbation with an industrial genesis (Szajnowska-Wysocka 1995, 2007, Tkocz, 2001, Petryszyn & Zuzańska-Żyśko 2008, 2014). Until the end of the 80. of the 20th century it was known as Upper Silesian Industrial Region and it was the main industrial region of Poland, with heavy industries being predominant. Mining industry, metallurgy and other related activities took its toll on the environment and resulted in its tremendous degradation (Oleś et al. 2004, Pełka-Gościniak 2006, Dulias 2010, Rzętała M.A. 2015). Therefore, the region was facing multidimensional problems, not only of an environmental origin, but also of social and economic ones (Tkocz & Railey 1999). The redevelopment of this region has started at the beginning of 1990s. along with the transformation of political system of Poland. For 25 years it was undergoing difficult restructuration. Nowadays, in the majority of towns and cities the transformation process has finished, however some of them struggle with an outdated and old-fashioned economic structure, and are in-between the old and the new development path (Szajnowska-Wysocka & Zuzańska-Żyśko 2013, Gwosdz, 2014).


*Figure 1: The Metropolitan Association of Upper Silesia*

The Metropolitan Association of Upper Silesia has been created by local authorities with little or no actual public discourse. The intent to form the union was formally stated by the mayors of the participating towns, who signed a declaration to this effect on 9 January 2006 in Świętochłowice The Union's registration was signed by the Ministry of Internal Affairs and Administration of the Republic of Poland (Polish: MSWiA) on 8 June 2007 with the city of Katowice. The idea was to create a uniform, large urban system ("Silesia") from the Upper Silesian conurbation which would be managed by a "supramayor" but with the preservation of own identity and functional structures of individual cities in default of an administrative and legal act (fig. 1).

The aim of the union was the creation of a strong metropolitan center with pooled resources, an internationally competitive profile and unified management of common infrastructure. The effects of the union's activity include: improvement in managing the consortium, strengthening its economic muscle and increasing the competitive standing of the towns of the Metropolitan Association of Upper Silesia, coordination of public relations and promoting the member towns, and underscoring the importance of the region (Górnośląski...., 2008, Chmielewska & Szajnowska-Wysocka 2010, Szajnowska-Wysocka & Zuzańska-Żyśko 2013). Nowadays, it appears that the region is gradually entering a new

development phase where first signs of metropolization can be spotted (Zuzańska-Żyśko, 2016). Furthermore, not only towns co-creating the Metropolitan Association of Upper Silesia are the metropolis, actually the study area is only the core of much bigger Upper-Silesian Metropolitan Area in central Silesian Province (fig.1).

**3. Revitalisation of post-industrial urban space**

Revitalisation is a sequence of planned actions aimed at social and economic recovery of the degraded part of the town. It includes comprehensive changes in spatial, functional, urban, infrastructural, social and environmental structure of the urban space. It is a particularly complex, long-lasting and interdisciplinary process, in which numerous organizations and institutions are actively involved (Kaczmarek 2001, Heller 2002, Lorens 2010, Kopeć 2010). The notion 'revitalisation' refers to actions conducted on the existing urban areas which, for various reasons, have degraded (Behr Et Al. 2003). Considering the initial use of the urban space, degraded urban areas can be divided into four groups: 1) housing areas, 2) multifunctional complexes, 3) areas with technical and industrial infrastructure and 4) urban wastelands (Lorens 2010).

A special type of the degraded urban space are brownfields. According to Lorens's (2010) division brownfields are included into the third group – the areas with technical and industrial infrastructure. Characteristic features of this group are: the loss of hitherto function and the exclusion from use, as well as the lack of permanent inhabitants. The success of revitalisation of such areas is dependent on external factors, in particular the spatial accessibility, and internal factors such as size of the area and the type of building (Gasidło 1998, Domański 2000). The advantages of brownfield sites are their proximity to the city center and the transport infrastructure (Behr Et Al. 2003). However, the environmental pollution, infrastructural barriers and ownership barriers may make it difficult to re-use former industrial areas (Jarczewski 2010).

Because of the specific circumstances outlined above, the revitalisation of brownfields is particularly complicated. It is often associated with regeneration (restoring value through renovation or modernization) of historical buildings or technological monuments, it frequently requires expensive liquidation of industrial installations and purification of the environment from pollution (land reclamation), but mainly it is related to the introduction of new functions and communities into these areas (Domański 2010, Lorens 2010). Revitalisation of post-industrial objects involves also morphological changes of the urban space (Chmielewska 2012, Chmielewska & Otto 2013).

According to Baborska-Narożny (2012) there are five transformation models of post-industrial areas: 1) revival of industrial function making use of modernised existing buildings, 2) revival of industrial function and restoring existing buildings accompanied by introduction of new functions and buildings, 3) using the existing building and infrastructure to establish an industrial heritage site, 4) adapting the area and post-industrial buildings to a new functions, 5) demolishing the post-industrial buildings, changing the site's character and function. It is similar to the point of view of Chmielewska (2012) who divides transformation of post-industrial areas on the basis of morphological and functional changes in urban space caused by revitalisation.

**4. RESULTS**

Post-industrial areas in the Metropolitan Association of Upper Silesia are diversified. On the one hand, they differ due to the branch of industry, the size and the level of

degradation. On the other hand, due to the degree of their ties with industrial activity they may be divided into 4 groups: areas of the industrial plants, single post-industrial buildings, facilities accompanying the industrial plant such as workers housing estates, and industrial wastelands. Examples of the revitalisation of post-industrial areas in the Metropolitan Association of Upper Silesia are presented according to the second division.

### 4.1. Revitalisation of the areas of the industrial plants

Areas of the industrial plants are a group of objects covering a large space, characterized by specialised buildings (such as eg. towers of mine shafts, blast furnaces and production halls). The large size of space occupied by them are a major advantage for regeneration projects, it provides an opportunity for diverse, often multidirectional redevelopment of such urban area. Nevertheless, the presence of a specialized building is inconvenient. In most cases the buildings are demolished. Some projects, however, provide the possibility of incorporating the existing buildings in the new facility, especially when it is historic.

One of the most outstanding revitalisation project implemented in the area of former industrial plant is the transformation of former Coal Mine "Katowice" (originally "Ferdynand") in Katowice into the "Area of Culture". Due to the attractive localization of the site many institutions wanted to take over this space (i.a. higher education institutions: Academy of Fine Arts, the Academy of Music and the University of Silesia), but in the end the decision was made that it would be the location of: new headquarters of Silesian Museum, as well as the Concert Hall of Polish Radio's National Symphonic Orchestra and the International Congress Centre. After the closure of the mine in 1999 the liquidation of buildings in poor technical state and impossible to adapt to different activity (function) had started. But most valuable historic buildings: the tower of the mine shaft "Warszawa II", the "Bartosz" shaft complex, with its unique (on a European scale) steam hoist, an electrical and mechanical workshop and the carpenter's shop, were taken under the care of a restorer and renovated. These historic buildings were than adapted for new purposes and are parts of the new site of Silesian Museum. During the revitalisation some additional modern facilities were also built there. The aim of the project was that all the museum construction levels are situated below the ground level and above it only the glass towers that are the source of natural light for the exhibits beneath are visible. Thanks to this very idea, there is no risk that all the historical buildings of the former coal-mine will be dominated by the modern part of the new museum construction, even though they are situated in the background. In turn the Concert Hall of Polish Radio's National Symphonic Orchestra and the International Congress Centre were created in place of brownfields devoid of building so that their only connection to the industrial past of the site is hidden it their architecture: the Concert Hall is made of bare bricks with red window frames – like in typical workers house and the International Congress Centre is covered with a black glossy surface resembling hard coal. The "Area of Culture" is open for visitors since 2014.

Different direction of revitalization was chosen for the redevelopment of "Gottwald" Coal Mine which was converted into a shopping and entertainment

centre Silesia City Center. The realization of this enterprise was entrusted with a Hungarian company - TriGranit Development Corporation and the centre was opened in November 2005. During the revitalization almost all old buildings were destroyed, there are preserved only 2 of them: the restored boiler room of the shaft machine houses adapted for the Almi Decor art gallery and the main offices of the SCC, as well as the "Jerzy" shaft engine room where the St. Barbara's Chapel was located. The second part of the investment located in former coal mine area has been the construction of the "Oak Terraces" housing estate of four 11-floor buildings and eight 4-floor buildings with modern and luxurious apartments.

An example of revitalization in progress are the activities in place of former Non-Iron Metal Works in Szopienice (a part of Katowice). The plant took its origin in 1834 from the Wilhelm's Zink Works. In the course of history it took over other Zink Works in Szopienice (Paweł, Abendstern, Norma, Uthemann, Bernhardi) and also a Lead Works (called Walter Croneck). Later it produced also cadmium, silver and liquid $CO_2$. In the 20th century the complex of Szopienice Non-Iron Metal Works became the biggest in Silesia. In 2008 the company was dissolved and liquidated. Since then assets and estates of plant have been for sale for office buildings, service facilities, manufacturing storage sites and warehouses. In this site works also the Association for the Establishing of a Museum of Zinc Mill. Aims of the association (apart from creating a Museum of Zink Mill) are: protection of the existing historic industry facilities of the "Szopienice" Co., promotion of the old metallurgic technologies, organization of a cooperation platform on a cultural level between old industry protecting centres in Silesia and similar centres in another regions and countries, creation of a lobby to protect the industry monuments, supporting of un-commercial initiatives undertaken to protect the old industry monuments, cooperation with territorial governments and government administration in the field of old industrial monuments protection. The association has already adapted a building of Zink Mill from 1904 which is covered by the conservation protection with all the equipment for manufacturing sheet metal (mills, steam engines, flywheels, melting furnaces etc.).

### 4.2. Revitalisation of single post-industrial buildings

Post-mining and post-metallurgic buildings occurring in large numbers in the urban space of the Metropolitan Association of Upper Silesia because of its specific character and its previous purpose are a group of objects difficult to regeneration. This does not mean, however, that it is impossible. On the contrary, in the studied region at least a few interesting examples of transformation of post-industrial buildings may be indicated.

One of the most interesting projects of revitalisation of this kind of post-industrial object is an adaptation of a building of a lamp room next to the "Bolko" mining shaft from the Mining and Metallurgy Plant "Orzel Bialy" in Bytom for a loft in 2003. The building is in shape of a rectangular prism placed on concrete pillars. Its designer – the architect Przemo Lukasik lives there with his family.

Another example is the Wilson Shaft Gallery in Katowice. The pithead building and baths of the former "Wilson" (originally "Richthofen") shaft of the "Wieczorek" (originally

"Giesche") coal mine, designed in 1918 by the Zillmanns, was adapted for a modern art gallery. Changes started in 1998 with opening of the so called "small gallery". Two years later the object was extended with the "middle gallery" and the "big gallery". Nowadays the area of the facility is approximately 2500 $m^2$ and comprises three exhibition rooms where displays, happenings, concerts and film shows of Polish as well as foreign artists are held. There are also pictures painted by members of the Janów Group - a group of painters-amateurs, miners by profession, established in the middle of the 20th century. Among the members were Ewald Gawlik, Paweł Wróbel i Teofil Ociepka.

Artistic connections has also a post-industrial object in Chorzów – "President" mining shaft (originally named "Wielki Jacek") from 1933. The tower with an exceptional, steel-reinforced concrete structure and height of 42 m - as one of the most modern at that time in Europe - had two rope pulleys with the diameter of 5.5 m set in parallel to each other. Along with related equipment, including a 10-ton skip hoist, it was capable of drawing out to the surface over 500 tons of coal per hour. Since May 2014 at the top of the tower is the observation deck. Next to the shaft is the "Sztygarka" complex: a restaurant, a guesthouse, Day SPA, "Fire Brigade" Gallery and Cafe "Pod Wieżą", all located in post-industrial buildings. This site is a host of numerous artistic and cultural undertakings organized by The Sztyg.art Association, which operates at Sztygarka and is the carer of the tower.

### 4.3. Revitalisation of facilities accompanying the industries

A large group of post-industrial objects are workers housing estates which may be classified as facilities accompanying the industries. They were built by the industrialists who owned industrial plants to provide housing for their employees. In most cases, these settlements have survived longer than the plants they were created for and they still exist in urban space. Unfortunately, even though some of them are unique in terms of urban planning and architecture, most of them is characterized by low standards and poor technical condition and require renewal (Chmielewska 2009).

An interesting example of regeneration of the workers settlement is the Ficinus Colony in Ruda Śląska. The 16 two-storey houses making up this housing estate were built in 1860s not of brick, but of sandstone extracted from the Silesian quarries. Houses were inhabited by miners working in the nearby mine „Gottessegen" – 4 families for a house. Until recently, these houses fell into ruin. Today most of them are renovated. Their regeneration has been not, however, relied solely on external renewal. Only part of the building has retained its original residential function, most of the were transformed in the service facilities: shops, pubs and restaurants.

Differently is with Nikiszowiec workers' housing estate as well as neighbouring Giszowiec workers' housing estate located in Katowice, which still are inhabited by miners or their descendents. Actually, these are the most remarkable workers' settlements and they were distinguished from all other that kind of objects in region because of their uniqueness – they were both designed by famous architects: Emil and Georg Zillmann and, according to the standards of those times, they offered an extremely high standard of life. Both of them were built for employees of "Giesche" (later "Wieczorek") coal mine located in Janów (nowadays a part of Katowice). Despite they were created by the same architects they are significantly different from each other. Giszowiec (built 1906-1910) has a rural character - it contains from small houses with garden modelled on upper-silesian country side huts, and its

layout refers to the Howard's idea of a garden city. Nikiszowiec (built 1908-1915) on the contrary has an urban character, it comprises 9 compact 3 storeys building quarters connected by means of characteristic batten plates. In both settlements there were located public buildings i.a.: shops, schools, guesthouse, beanery, bath and wash-house with a mangle house. They were also connected with the mine and with each other by a narrow railway "Balkan Express".

Nikiszowiec, which in 2011 gained the title of "Monument of History", is preserved practically unchanged but Giszowiec, in the course of history, has almost been destroyed. In the 1970. some houses were demolished for the construction of blocks of flats. Luckily the remains of the old building was shortly taken under the conservation protection. Nowadays the settlement is a mosaic of old small houses and younger high block of flats built from of concrete slabs. In the middle there are preserved old public buildings adapted to new functions – for example: art gallery in the former stable, kindergarten in former forest inspectorate building.

All three mentioned workers housing estates have also a tourist attractions as they are located on a local post-industrial tourist trail called the Industrial Monuments Route of the Silesian Voivodship.

### 4.4. Revitalisation of industrial wastelands

The last group of post-industrial urban spaces are industrial wastelands. These are mostly large anthropogenic forms, resulting from building or destructive industrial activities. In both cases, these facilities transform the area they are located in significantly. In addition, after decommissioning the plant, they were used by, they become deprived of function and worthless. Most of them are managed to gain new values, usually by adapting them into recreation and leisure facility.

One of the first revitalization of projects implemented in the study area, long time before anyone used the term "revitalization" and before The Metropolitan Association of Upper Silesia was established, was the creation of the "Silesian Park" (originally named "Voivodeship Park of Culture and Recreation") in place of industrial wastelands: mining tips, muddy ponds and waste dumps, located in the triangle between Chorzów, Katowice and Siemianowice Śląskie. It was created in 1951 on the initiative of General Jerzy Ziętek. It is more than 600-acre recreational complex, the total length of the alley walking is more than 80 km. The attractions of the park include: Amusement Park, Silesian Zoological Garden, Silesian Stadium, Planetarium and Observatory, Open air swimming pool "Fala" and the Upper Silesian Ethnographic Park. Today, the park is regularly modernized, among others thanks to the EU funds.

A large group of industrial wastelands easy to regeneration are the artificial reservoirs. There are a lot of them in the Metropolitan Association of Upper Silesia. Has in the past around them often the recreation centres were created, many of which are now neglected and requiring urgent attention. In addition to the recreational functions, water reservoirs often act as a form of nature protection. As an example might be presented artificial pounds created after flooding sand pits: Pogoria I, Pogoria II and Pogoria III in Dąbrowa Górnicza.

Recently, also a very interesting revitalization project was implemented in Szombierki – the district of Bytom. Mining tips and wastelands were changed into golf field and housing estate. In addition the neighbouring mine shaft "Krystyna" is going to be changed into a luxury hotel, offices or lofts. Top of the tower is planned to be adapted for a restaurant with a viewing point on the skyline of Bytom.

## 5. DISCUSSION

Former coal mines, steelwork, factories and other industrial plants are the important part of urban space of the Metropolitan Association of Upper Silesia. Revitalisation of this kind of areas is crucial for redevelopment of the whole post-industrial region they are located in. It helps to balance the disturbed social and economic structure of the region and also to find a new path of future development and as a further consequence to change in the perception of the region both by the residents and visitors.

In the paper there are given only a few examples selected from other more or less successful revitalisation projects implemented in the study area, but the main directions of revitalisation are outlined here. These directions are similar to directions of revitalisation chosen in other countries like Great Britain, Germany or France (Kostrubiec & Lamparska 2008, Lamparska 2013, Lang 2005, Zlonicky 2009).

It is a common trend to give post-industrial objects, especially of historical value, a new cultural function. Such places are successfully changed into museums, also open-air museums (e.g. Nachtigal Coal Mine in Witten, Germany) and underground museums (like not mentioned before but located also in the study area Guido Coal Mine in Zabrze) . Recently, there is a tendency to organize other kind of cultural objects in post-industrial sites as well, and these are: art galleries, exhibition centres, concert halls, etc. (e.g. Union Brewery in Dortmund and Jahrhunderthalle in Bochum, Germany). All this facilities have another function too, they are the tourist attractions (Chmielewska & Lamparska 2011).

Turning post-industrial sites into the tourist attractions is one of the most popular practice in revitalisation. In Europe there is an extensive tourist trail leading threw traditional industrial regions all over the continent – the European Route of Industrial Heritage, and there are also national or regional tourist routes, for example the Route of Industrial Culture in Ruhr Area in Germany and the Industrial Monuments Route of the Silesian Voivodship in Poland (leading through the study area). These trails connect most valuable post-industrial objects. Some of them are just monuments or landmarks, other are turned into museums, another into restaurants, and there are some changed into leisure and recreational areas as well. So the tourist function is usually an addition to another one (Chmielewska 2015).

Former industrial areas can, quite easily, be adapted for recreational purpose. For example, there are a lot of park organized in such a space in Ruhr area in Germany. There is a North Duisburg Landscape Park in place of ironworks, Nordstern Park in Gelsenkirchen and Maximilian Park in Hamm created in place of coal mines, and there is a Landscape Park on the waste tip Hoheward in Herten (Chmielewska 2010, Steins 2008). Such sites, especially spoil tips, are also used as sport grounds like diving centres, climbing walls, ski slopes and play grounds for children, or simply adjust to be a pleasant place to go for a walk (Chmielewska & Otto 2014).

In Poland probably the most popular way of revitalisation of post-industrial areas is to change them into the shopping and entertainment centres. In some cases (for example Manufaktura in Łódź, mentioned before Silesia City Center in Katowice and Stary Browar in Poznań) large centres use old buildings and the previous purpose of the place is commemorated. More frequently new shopping centres are simply build in place of industrial plant and there is no sign of its past (e.g. Platan in Zabrze in place of Iron-Works, also located in the study area). In Ruhr Area creating shopping and entertaining centres is not so popular as in Poland, but there is a one very interesting object. CentrO in Oberhausen, which was risen in space previously used by steelworks, except of shopping mall consist of

Entertainment Park, Marina and Aquapark so it is a really large redeveloped complex (Joly 2003, Prossek 2004).

Smaller post-industrial objects like single buildings, former factory shops, mine shafts etc., are quite often changed into office blocks (for example Morkski Brewery in Katowice, Poland, Union Brewery in Dortmund, Germany). Such former industrial buildings are also arranged for apartments (like in Docklands in London, Great Britain), for art galleries and exhibition halls (Gasometer in Oberhausen, Germany).

There is, at last, possibility to revitalize space without changing its function. Some industrial brownfields simply keep its previous function, the only thing that changes is the production profile, usually into high-tech industries. Such a situation takes place, among others, in Phoenix West in Dortmund (Germany), (Chmielewska 2012), and in Euro-Centrum Industrial Park in Katowice (located in the study area). In post-industrial regions there are some Technoparks, too (Chmielewska &Otto 2013).

## 6. CONCLUSIONS

In conclusion it might be noticed that there are a lot of ways to revitalise post-industrial sites in Metropolitan Association of Upper Silesia as well as in other post-industrial regions in Europe. In the paper the most popular directions of these actions are listed. In the majority of these directions, revitalisation is associated with the succession of function and leads to change the usage of space from industrial into: cultural, tourism, recreation, leisure, sports, entertainment, shopping, business and housing. Though in most cases revitalised areas combine two or more of these functions. In addition there is a possibility that the redevelopment of a site does not entail the succession of function and the industrial usage is kept.

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