

Role of green areas for space integration of Kraków's Metropolitan Area

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Abstract. The Kraków Metropolitan Area (KOM) is a specific functional region comprising a big city that is the Kraków metropolis, together with its neighbouring complex of settlements with a variety of mutual interactions. The social and economic space requires multi-dimensional enhancement of its interrelations and partial rehabilitation of its developed areas; it constitutes, at the same time, a potential which strengthens the position of Kraków as a European city. A clear structure of the metropolitan area and its internal links through green seams provide the basis for functional and spatial integration of the metropolis. The greenery, comprised in larger natural structures such as river parks and green wedges, enhances the area's polycentric concept. The shaping of the urban tissue of Kraków and its suburban zone by composing and building a network of open spaces is the basic criterion for developing a coherent metropolitan area with a sustainable structure. Many problems of the urban environment and its surroundings can be fully understood through their analyses in various scales. In order to better illustrate this complex system of interrelations, reference should be made in analyses to the macroregional scale then narrowing them to the regional scale, to ultimately go down to the metropolis. The issues covered in the paper concern open areas which should not be discussed without a broader spectrum because the notion of green areas is understood to mean primarily spaces which are networked and intertwined with the settlement structure. Some of them are clear, for instance the greenery which accompanies water courses, and easy to identify. Marshlands are mostly linearly continuous and this makes them coherent in their nature. Other green areas (apart from larger forest complexes) are not of essential significance for the integration of the metropolis. The example of Kraków shows that the KOM (1) has a big potential expressed through its natural environment in the form of green areas. The anthropopressure, however, is so high that open spaces are being absorbed by developments. It is riverside areas which have retained a clear structure of interrelations and they should be perceived as the future for the links in the metropolitan area.

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1. Introduction

The social and economic space of the Kraków Metropolitan Area (KOM) requires multi-dimensional enhancement of its interrelations and partial rehabilitation of its developed areas; it constitutes, at the same time, a potential which strengthens the position of Kraków as a European city. A clear structure of the metropolitan area and its internal links through green seams provide the basis for functional and spatial integration of the metropolis. The greenery, comprised in larger natural structures such as river parks and green wedges, enhances the area's polycentric concept. The shaping of the urban tissue of Kraków and its suburban zone by composing and building a network of open spaces is the basic criterion for developing a coherent metropolitan area with a sustainable structure. Many problems of the urban environment and its surroundings can be fully understood through their analyses in various scales.

2. Material and research method

In order to better illustrate this complex system of interrelations, reference should be made in analyses to the macroregional scale then narrowing them to the regional scale, to ultimately go down to the metropolis (Hrehorowicz-Gaber, Sikora, 2013). The issues covered in the paper concern open areas which should not be discussed without a broader spectrum because the notion of green areas is understood to mean primarily spaces which are

networked and intertwined with the settlement structure (Korcelli-Olejniczak, 2012). Some of them are clear, for instance the greenery which accompanies water courses, and easy to identify. Marshlands are mostly linearly continuous and this makes them coherent in their nature. A list of green areas of considerable significance to the KOM's spatial structure should also include larger forest concentrations, protected landscape areas, the Ojców National Park (Ojcowski Park Narodowy) and the Niepołomice Forest (Puszcza Niepołomicka) as places of leisure located in close proximity of the metropolitan city. The role of green areas of other types, that is to say meadows, afforestations, farmlands, wetlands, etc. in the metropolitan area is not that great in binding its spatial structure (Gołąb-Korzeniowska, 2011).

The strongly urbanized area of Kraków went beyond its administrative borders a long time ago, posing a threat to the natural environment. The western part of the KOM's landscape is legally protected (Ojców National Park, landscape parks), whilst its south is still a zone of the region's highest urbanisation which leads to continued depletion of green areas. In pursuance of a balance of their network, green areas should be protected against the threat of urbanisation. One of non-legislative options is to change the forms of use and the need to sanction the same in the land development planning documents at the level of local law (with the applicable stipulations to be provided in the local land development plan (MPZP (2)) as well as in internal planning documents (studies defining the conditions for, and directions of land development, SUIKZP (3)).

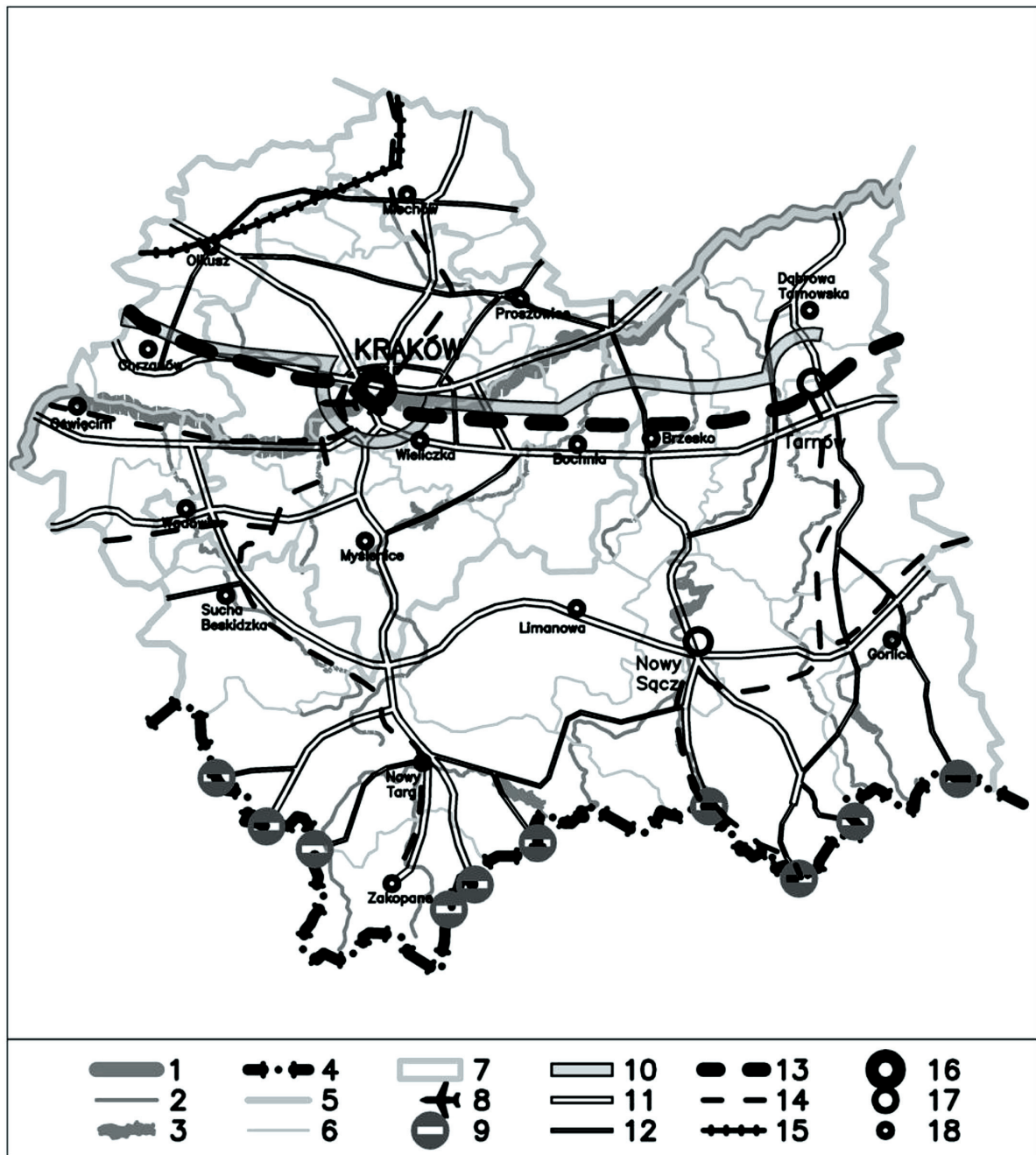


Fig. 1. Identification of the macroregion with reference to the KOM (Krakowski Obszar Metropolitalny – Kraków Metropolitan Area), against the background of the accessibility of transport and the river network

Explanation: 1 - Vistula river; 2 - Main Vistula tributaries; 3 - Water reservoirs; 4 - State border; 5 - Voivodship border; 6 - County border; 7 - Kraków Metropolitan Area; 8 - International Airport in Balice; 9 - Border crossing; 10 - A4 Motorway; 11 - National roads; 12 - Other main roads; 13 - Main railway route; 14 - Railway routes; 15 - Broad gauge railway route; 16 - Voivodship seat; 17 - County right seats; 18 - County seats

Source: Author's compilation

3. Study area

Concerning the region's administrative borders and narrowing the considerations to Małopolska itself, one can, using the method of successive approximations, identify areas which are the keystones integrating space and its related green areas. The principal area of key importance for the region, the city of Kraków and its surroundings, is the upper Vistula River together with its immediate neighbourhood.

Nominally, the Upper Vistula has its beginning in the Beskid Śląski mountain range and, cutting through the Śląskie Foothills (Pogórze Śląskie) and the Oświęcim Basin (Kotlina Oświęcimska) in the macroregion of the Krakowska Gate (Brama Krakowska) (4), it shapes the KOM's structure and landscape. However, further considerations of the impact of the greenery structure should be limited to the area between the Krakowska Gate and the village of Uście Solne with Vistula's tributaries (Skawa, Skawinka, Rudawa and the biggest one, Raba) (Trafas, 1988; Pociask-Karteczka, 1994). The river network is a natural factor determining settlements and contemporarily forms a characteristic of the area's attractiveness. Despite a considerable risk of floods (5), the Upper Vistula River area is being gradually urbanized (Zaleski et al., 2011). The extending Kraków metropolis has now covered most of these four tributaries. The largest of them, the Raba River, is, at the same time, located in an area of the KOM which is most attractive in terms of its natural assets. The considerable urbanization of the area necessitates the protection of the other non-urbanized green areas, the clearest and most compact of them being the Raba River valley (6).

The settlement structure in the KOM is uneven and most of it has historically developed in the southern part of the metropolitan area which – clearly more scenic – has been perceived for years as more appealing than the northern or eastern suburbs of Kraków.

Adopted under Resolution No. XV/174/03 of the Małopolska Regional Assembly of 22 December 2003, the land development plan for Małopolska (Plan Zagospodarowania Przestrzennego Województwa Małopolskiego) (7) laid down the metropolitan area consisting of the city of Kraków with

the county status, 15 urban/rural gminas (administrative regions of the 3rd order) and 36 rural gminas (8-9).

In order to make the foregoing considerations clearer and relate them to the settlement network, the transport system – which is a reliable measure of the impact exerted by the city upon its surrounding region and which is used to identify the limits of the metropolitan area – has been superimposed on the layout of green areas. Mobility characteristics point to social and economic links which relate, in functional terms, to transport availability. Hence, in the KOM, the external area, which reaches far beyond the immediate impact of the city, is defined by the commuting zone. Over the past twenty years, the spatial impact of Kraków has been characterized strongly by a considerable increase in development north and north-east of the city, towards areas which had not been perceived as attractive to reside in before. The natural attractiveness of the southern areas, however, has not balanced the transport difficulties and the increasingly longer isochrones of travel to work and school.

The settlement pressure in the south has dropped. A threatening increase, however, has been noted in the northern suburban zone; as a result, developments have spread and larger and larger open spaces, which to date have been used for agricultural purposes, are being taken over for development. The method of functional analyses demonstrates that the northern side of the KOM is not provided with such clear natural barriers as is the case with its southern part. Because of this, the land conditions allow the construction of rather scattered developments whilst compact estates (often enclosed), separated from the their surrounding spaces, are sometimes set up at a considerable distance from the main city. The linking of the peripheral areas with the city is becoming a necessity relating to their functions and protection requirements.

4. Results

Greenery has a considerable functional importance in view of the growing transport difficulties and the increasing number of cars. Green belts are carriers of alternative means of transport, that is, bicycles

in the first place (10). The other aspect involves the protection of green areas against their continued de-

pletion and reduction dictated by wrongly understood market economy (Węclawowicz-Bilska, 2008).

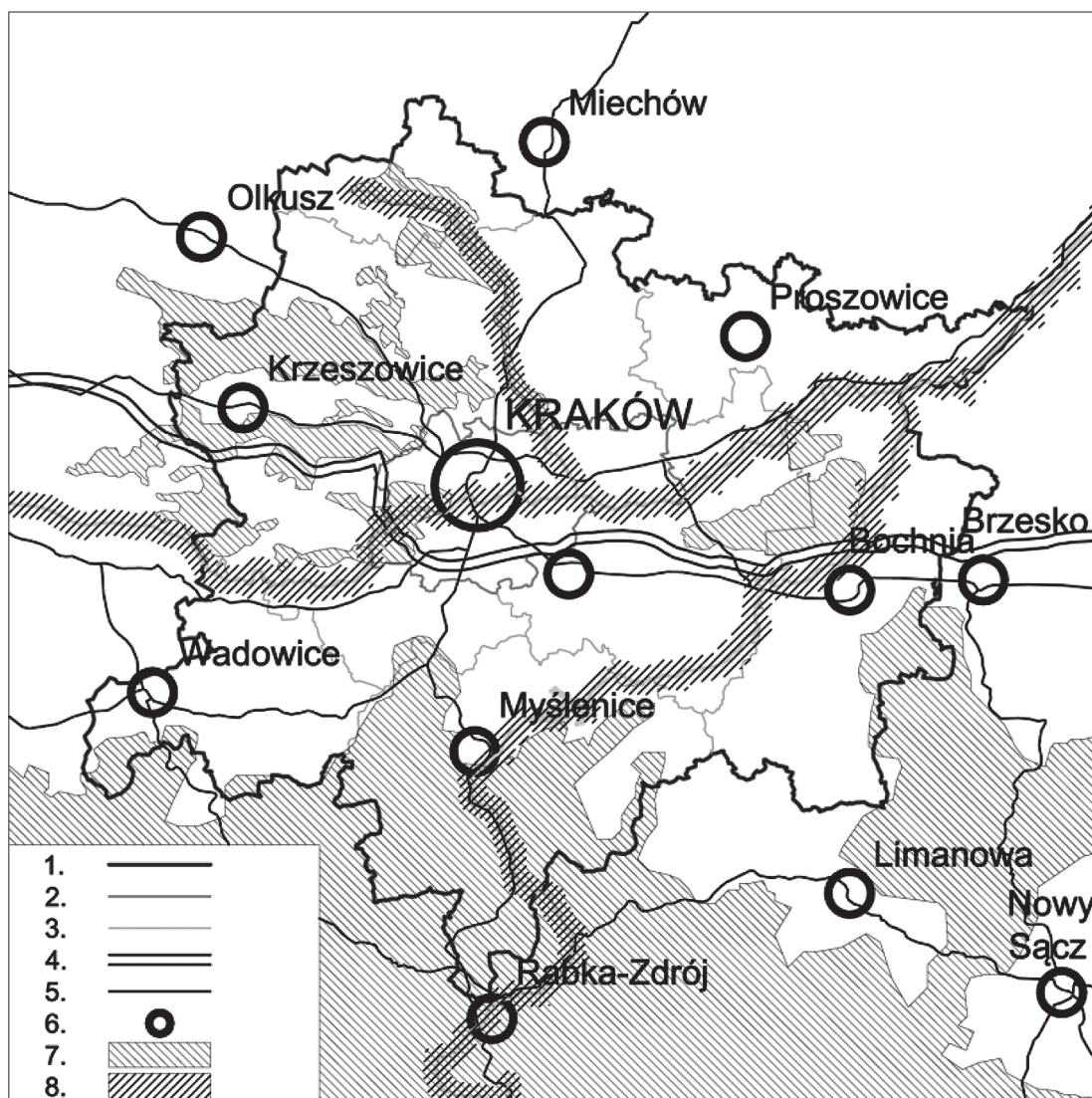


Fig. 2. Greenery layout in the KOM; main greenery routes and links

Explanation: 1 - Kraków Metropolitan Area; 2 - County borders; 3 - Municipality borders; 4 - A4 Motorway; 5 - Main roads; 6 - Local authorities seats; 7 - Green areas; 8 - Main river corridors

Source: Author's compilation

During the systemic changes, as a result of Poland transforming from the command-and-quota economy and shifting towards empowerment, green areas began to disappear on a massive scale, replaced with new developments and increasingly fragmented settlement structures. This process has continued ever since. Throughout this time, approximately 30% of open areas used in a variety of ways have vanished (taken up by the new develop-

ments). Currently, as shown on the Vegetation Map of Kraków City (11), a considerable portion of the remaining green areas is formed by various types of wasteland, the scattering of which is the result of small land holdings in the city and outside.

Legal protection offered under the Natura 2000 programme and the increasing activity of environmental organisations are the factors which only slow down the urbanization of space. This has its advan-

tages but disadvantages, too. A rescue option for balancing the structure seems to be stimulation of the other areas, putting them together into bands and making them available to residents of urban complexes. Areas within Kraków's reach will sooner or later become the subject of economic speculations with their non-profitability resulting in a change in their function from greenery to areas from which their owners (be it representatives of authorities, individuals or corporate bodies) will generate a profit.

However, land management may not be considered in economic terms only, and immeasurable values such as beauty, spatial and social harmony, are essential elements in the game for open space. Various subsidies (from the UE above all) could be of help to enable provide the design and pursuance of projects aimed at stimulating the development of green areas for recreational purposes.

Numerous valuable initiatives which favour the combining and networking of green areas result

from active recreation of the residents of Kraków and the KOM (Zachariasz, 2006). Amongst the numerous projects, reference should be made to EuroVelo (12), and bicycle paths as well as cross country skiing routes along the Raba River.

A valuable initiative intended to provide a clear vision of the greenery along the Raba River Valley has been put forward by the municipalities of Dobczyce, Gdów, Bochnia, Kłaj and Drwinia. The Raba Open River project combines the protection of the valuable landscape with putting entertainment and tourist/leisure functions in focus. The idea is for each of the partner municipalities to include their green areas which are not located directly on the Raba but which offer tourist attractions and connect them – by bicycle routes and walking paths and numerous attractions – into one system. Consequently, a clear greenery arrangement will be formed on the area within the impact of Kraków and within the borders of the five partner municipalities.

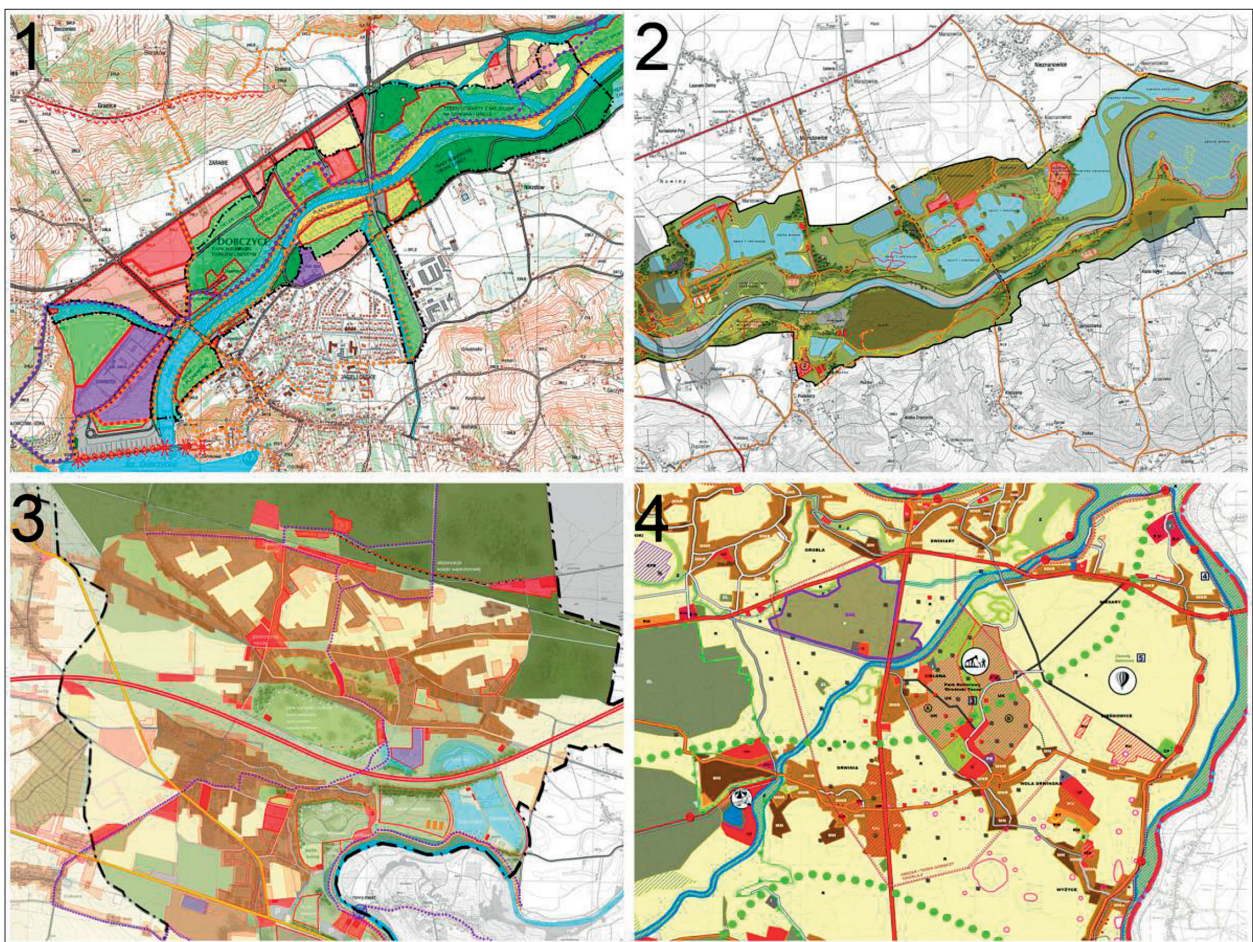


Fig. 3. Detailed studies for selected gminas

Explanation: 1 - Dobczyce; 2 - Gdów; 3 - Kłaj; 4 - Drwinia

Source: Author's compilation based on concept work from Gminas Authorities

The landscape of the Raba River Valley is largely formed by marshland with elevations along the valley borders and many post-excavation areas which are now being adapted for recreational functions under the Raba Open River project. Riparian forests are, however, the main settlement areas and, as such, require protection on the one hand and are worth to be made available for recreational and educational purposes on the other.

5. Conclusions

It is indisputable that most of the greenery within the metropolitan area is not characterized by prominent natural advantages but only remains ecologically active by forming part of the ecosystem (Mapa roślinności rzeczywistej Miasta Krakowa). Facilitated access to green neighbourhoods offered to residents of the metropolitan area, and the possibility to use them to move within the ecosystem will considerably improve the quality of space, enhance the consistency of the metropolitan area and protect it, in part at least, against development projects. Green areas made available for recreational purposes will also give their owners a hope for profits to be generated from the tourist infrastructure which is inherently connected with leisure quarters. A clear green structure enhances proper development of areas which have an effect on the city's phytoclimate, the quality of the waters and the quality of life of its residents.

Notes

- (1) Kraków Metropolitan Area.
- (2) Due to its high precision, the local land development plan, which is a piece of local law, is a proper tool for the protection of green areas.
- (3) The study for the conditions for, and directions of land development (Studium Uwarunkowań i Kierunków Zagospodarowania Przestrzennego) sets the general prerequisites for the protection of natural attractions with the indication of their existing structure and potential new relations.
- (4) Geologically, this is a tectonic trench filled with Miocene sea sediments. The Krakowska Gate is part of the Vistula River Valley, and the city of Kraków is located at its eastern edge.
- (5) Commissioned by the Ministry of Internal Affairs and Administration (MSWiA) in 2010, after one of the most serious floods in the past decades, programmes to prevent floods in the upper Vistula River basin indicate a high population density rate of 178 residents/m².
- (6) The Raba River is a right-bank tributary of the Vistula, with about 130 km in length and a catchment area of 1,537.1 km²; it flows across the Western Beskidy Mountains, Zachodniobeskidzkie Foothills (Pogórze Zachodniobeskidzkie) and the Sandomierska Basin (Kotlina Sandomierska) in Małopolska. The sources of the Raba are above the town of Rabka, on the slopes of Obidowa mountain in the Gorce mountain range. Along the Raba River, in the town of Dobczyce, a retention reservoir has been set up to provide the city of Kraków with drinking water.
- (7) The new land development plan for Małopolska (Plan Zagospodarowania Przestrzennego Województwa Małopolskiego) is now being finalised, and its drafts were already made public and put to discussion in July 2013.
- (8) Excerpt from the land development plan for Małopolska. Małopolska Marshall Office (Urząd Marszałkowski Województwa Małopolskiego), to be found at: <http://www.malopolskie.pl/Planowanie/Kom/>
- (9) More in the publication by Hrehorowicz-Gaber, H. and Sikora, A., 2012: The dynamics of human-induced transformations of landscape in the sub-mountainous region on the example of metropolitan areas in south-east Poland. In: *Wisnik Teorja i Praktyka budiwnictwa*, Lviv: Nacjonalnyj Uniwesitet "Lwiwska politechnika", No. 756/2013, pp. 56-63. ISSN 0321-0499.
- (10) Not only this, however, because horse paths can be used to travel around the metropolitan centre itself; their network is beginning to develop based on horse-riding centres already present in the region's tradition.
- (11) Available from the Zielony – Kraków (green Kraków) portal of the Kraków City Hall.
- (12) EuroVelo is a project linking bicycle routes of Europe. The Polish sections are due to be completed by 2020. Thus they will complete

the 70,000 km of high-standard bicycle routes across Europe. The section within the KOM, along the Vistula, is labelled as No. EV4.

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