

ISSN 2081-4461  
e-ISSN 2449-9781

NR 21  
(2021)

# BIBLIOTEKA REGIONALISTY REGIONAL JOURNAL

**Hanna Adamiczka**

Wroclaw University of Economics and Business

e-mail: hanna.adamiczka@ue.wroc.pl

ORCID: 0000-0001-9906-962X

## **ANALYSIS OF THE LAND USE STRUCTURE OF THE WATERFRONT AREAS OF THE RIVER Odra IN WROCLAW BASED ON LOCAL PLANS**

---

## **ANALIZA STRUKTURY PRZEZNACZENIA TERENÓW PRZYBRZEŻNYCH RZĘKI ODRY WE WROCLAWIU NA PODSTAWIE PLANÓW MIEJSCOWYCH**

DOI: 10.15611/br.2021.1.01

JEL Classification: R58

© 2021 Hanna Adamiczka

*This work is licensed under the Creative Commons Attribution-ShareAlike 4.0 International License.*

*To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/4.0/>*

*Quote as: Adamiczka, H. (2021). Analysis of the land use structure of the waterfront areas of the river Odra in Wrocław based on local plans. *Biblioteka Regionalisty. Regional Journal*, (21).*

**Abstract:** The river Odra (Oder) in Wrocław is essential for the city as it constitutes a significant part of the urban fabric. The possibilities of its use depend on the degree of its development planning, and its length allows for functional differentiation. The article aims to present the spatial policy of Wrocław concerning the waterfront areas of the Odra. The degree of coverage of these areas by local spatial development plans was analysed. The methods used include desk research, case study, analysis of the researched areas using up-to-date cartographic materials, literature analysis, and the legal status. The conclusions may constitute an introduction to in-depth research on the spatial solutions of individual functions.

**Keywords:** the river Odra, land use, city, Wrocław.

**Streszczenie:** Rzeka we Wrocławiu jest szczególnie istotna, ponieważ stanowi znaczną część tkanki miejskiej. Możliwości jej wykorzystania zależą od stopnia zaplanowania jej rozwoju, a jej długość pozwala na zróżnicowanie funkcjonalne. Artykuł ma na celu przedstawienie polityki przestrzennej Wrocławia w stosunku do terenów nabrzeżnych Odry. Analizowano stopień pokrycia terenów nabrzeż-

nych miejscowymi planami zagospodarowania przestrzennego. Zastosowane metody to m.in. *desk research*, *case study*, analiza badanych obszarów przy wykorzystaniu aktualnych materiałów kartograficznych, analiza literatury i stanu prawnego. Wnioski mogą stanowić wstęp do pogłębionych badań na temat przestrzennych rozwiązań poszczególnych funkcji.

**Słowa kluczowe:** Odra, przeznaczenie terenów, miasto, Wrocław.

## 1. Introduction

The river is one of the essential city-forming factors (Ostrowski, 1996). The city-river relationship is individual, different for each urban unit, and it is the result of, among others, history, culture, politics, and community involvement. However, in recent years there has been a trend of cities to turn towards rivers, changing the way people think about water in the city. Generation Y (now 30–40 years old) is ecology-oriented, and combatting climate change is essential to them (Deloitte Global, 2020). There is also increasing public awareness of the impact of green spaces on health and well-being – this is one of the reasons why waterfront areas are becoming more and more popular and their potential is increasing. Due to the length of rivers and the diversity of the urban fabric, these areas can fulfill many functions, e.g. ecological and ventilation corridors, leisure and recreation facilities, an attractive location for investment, and infrastructure for water transport (Lis, Bocheńska-Skałecka, Burdziński, Gubański, & Walter, 2017). In Wrocław, rivers (especially the Odra) constitute an essential element of the urban fabric, and the local inhabitants believe that these areas should be developed in a diversified way.<sup>1</sup> According to Art. 232 of the Water Law Act, a waterfront strip of min. 1.5 m should be open to the public and cannot be fenced – the exceptions are some areas, e.g. protected areas (Ustawa z dnia 20 lipca 2017 r. – Prawo wodne). Therefore, most such areas are accessible to residents, but their attractiveness also depends on the arrangement method of access – both the quays and the surrounding area. For example, green and recreational areas encourage walks towards the river, and industrial areas are potentially more complicated and less pleasant to travel through. Therefore, the ‘activation’ of waterfront areas will be influenced not only by the law guaranteeing access to water, but also by how they and the surrounding area are being developed. The study aimed to present the spatial policy of Wrocław regarding the riverfront areas of the Odra. This was achieved by addressing the following question: what are the planned functions in the riverside areas?

The methods used to write the article (desk research, case study, analysis of the researched areas using up-to-date cartographic materials, literature analysis, and the legal status) are described below.

---

<sup>1</sup> Interviews were conducted during a survey of the inhabitants of Wrocław on the introduction of the city water tram. The study was conducted in cooperation with the Wrocław Development Office, and the Wrocław City Hall will publish the full report.

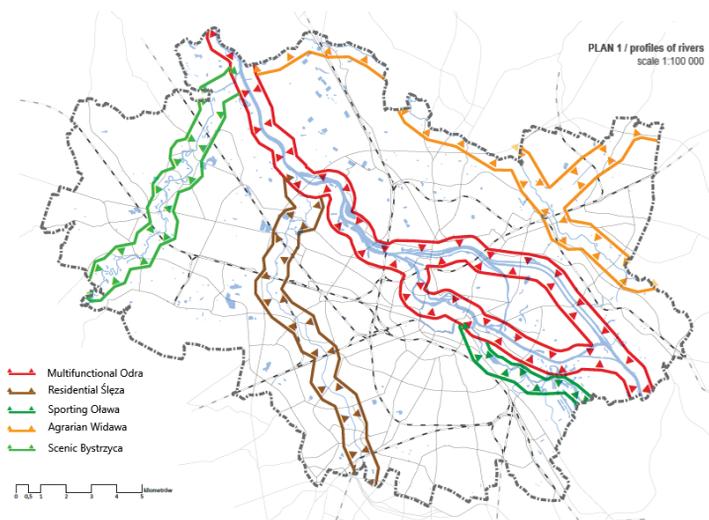
## 2. Materials and methods

In the GstarCad 2020 programme, a diagram of the Odra was created based on data collected from the Wrocław Spatial Information System on a scale of 1:10,000, where the riverside areas separated from the Odra by 200 m were marked. The distance was assumed based on the average walking speed determined as 4 km/h (Korwel-Lejkowska & Topa, 2017) – at this pace, a person will reach the designated area in approximately 3 minutes. This is the optimal time to reach green areas – a more prolonged time causes the distance to be covered to dominate the need to walk (Alexander, as cited in Korwel-Lejkowska & Topa, 2017). The next step was to apply the local spatial development plans to the drawings (which, unlike the study, are acts of local law of the commune) in a way that allowed for the spatial analysis of specific functions. The results were converted into numerical data and transferred to Excel, Microsoft Office 365, and the quantitative and qualitative data were compiled and analysed.

## 3. Study area

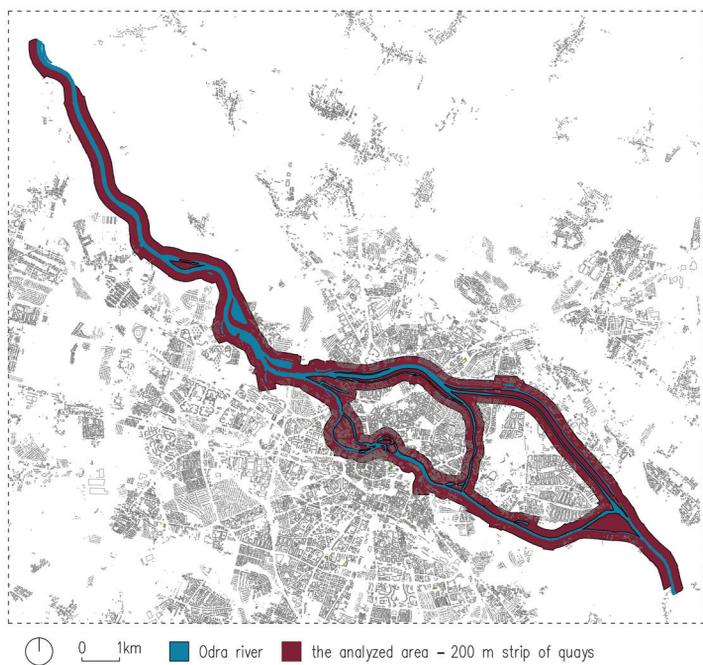
Wrocław is the capital of the Lower Silesia Voivodeship; its area is 292.8 km<sup>2</sup>, and the population numbers 642.9 thousand (Urząd Statystyczny we Wrocławiu [GUS], 2020). It is located in the south-western part of Poland, in the basin of the Middle Odra – the river Odra, together with its tributaries, forms a hydrographic network of over 100 km (LEMITOR Ochrona Środowiska Sp. z o.o. we Wrocławiu [LEMITOR], 2016). The Odra Valley is an essential element of Wrocław's identity as it concentrates and organizes space (both urbanized and natural), shapes the socio-economic structure, is a crucial element of the urban green system, and forms the basis of the Wrocław Water Junction. It can be divided into three parts – northern and southern, which constitute the natural zone, and the central one, which is highly urbanized (it comprises about 100 km of embankments with quays). Problems in this area include deficiencies in the development of riverside areas and (in some sections) poor riverside accessibility. In Wrocław's Spatial Development Study (Uchwała Nr L/1177/18 Rady Miejskiej Wrocławia z dnia 11 stycznia 2018 r.), the Odra was given a multifunctional profile, and its sections were classified into various sectors – multifunctional, residential, cultural, economic, sports and recreational, and natural.

During the study's preparation, the analysis of the accessibility to the river banks was carried out (Uchwała Nr L/1177/18 Rady Miejskiej Wrocławia z dnia 11 stycznia 2018 r.). The results showed that approximately 21% of the inhabitants reside within 1 km from the river banks, and around 53% – within 2 km, and the Odra and the Oława are characterised by the greatest accessibility (Uchwała Nr L/1177/18 Rady Miejskiej Wrocławia z dnia 11 stycznia 2018 r.). A kilometer is a distance so notable that it cannot be classified as convenient for walking. Assuming that the average walking speed is 4 km/h (Korwel-Lejkowska & Topa, 2017), it will take



**Fig. 1.** Plan of profiles of Wrocław's rivers

Source: (Uchwała Nr L/1177/18 Rady Miejskiej Wrocławia z dnia 11 stycznia 2018 r.).



**Fig. 2.** The Odra and the analysed area – 200 m strip of quays

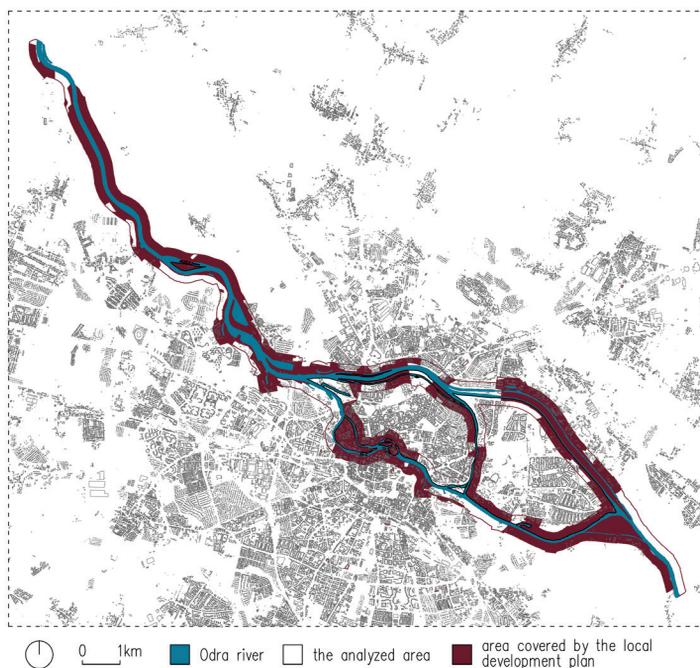
Source: own study.

15 minutes to cover 1 km and another 15 minutes to return, so the time spent by the river would be disproportionately short with that time. Due to this fact, the paper considered the quay strip the Odra increased by 200 m on each side.

The area of the river is 540.8 ha, and the analysed area (200 m strip of quays) – 1780 ha.

#### 4. Results

The analysed area is 1780 ha, of which 1186 ha (67%) is covered by the local development plan, and that area not covered by the local development plan, 594 ha (33%).



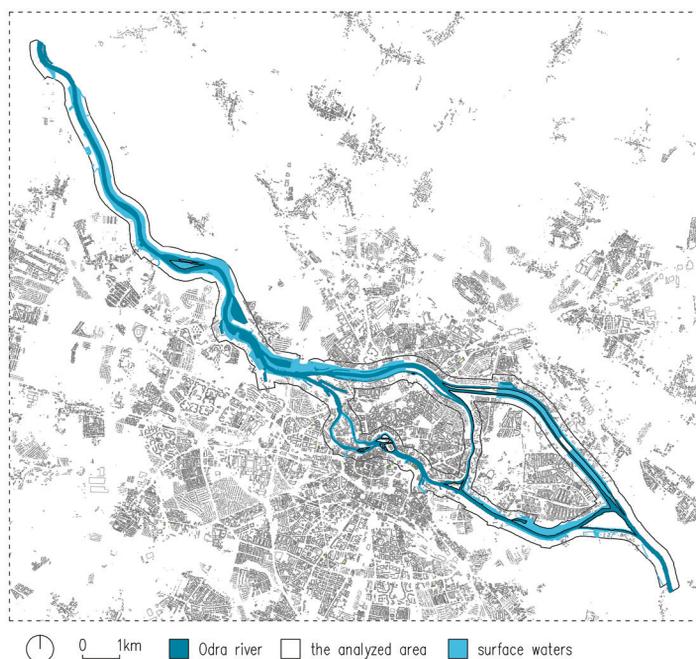
**Fig. 3.** Area covered by the local development plan

Source: own study.

The functions planned in these areas are for: surface waters, parks, allotment gardens, and cemeteries, public transport, woodland, multi-family housing, services, economic activity, sport and recreation, single-family housing, technical infrastructure, other areas of agricultural land, and internal communication. Some similar functions were combined into one and studied together: parks, allotment

gardens, cemeteries, and woodland are green areas; additionally, transport and infrastructure were analysed together, as were residential areas. Agricultural lands and other lands have also been merged.

The most significant part of waterfront areas, 30.5%, is intended for surface waters: “this should be understood as watercourses and reservoirs with related areas, including those used to carry floodwaters, hydro-technical structures, except for quays and boulevards, as well as objects similar to them, not belonging to a different category of land use.” These areas are often combined with a recreational function (e.g. Uchwała nr XLIII/1337/09 Rady Miejskiej Wrocławia z dnia 29 grudnia 2009 r.).

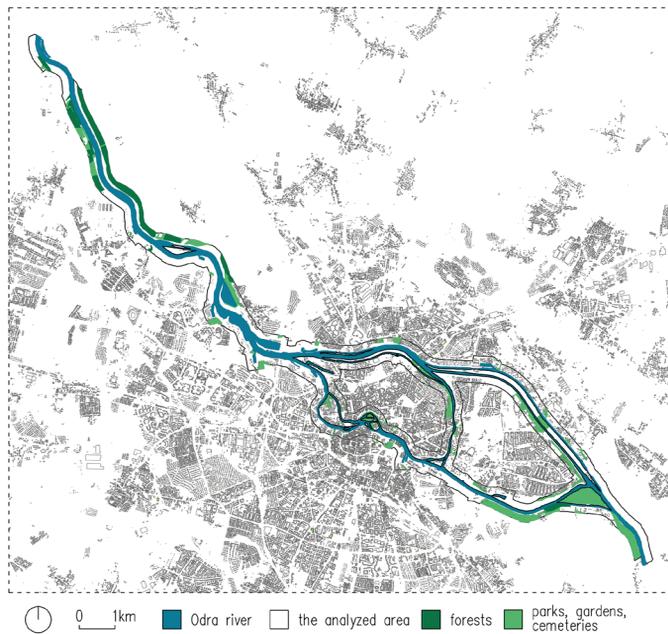


**Fig. 4.** Surface waters

Source: own study.

Surface waters are located along almost the entire river’s length, except for some sections in the city centre. Green areas are second in order – parks, allotment gardens, and cemeteries occupy 18.2% of the discussed area, and woodland an additional 9.1%. In total, green areas cover 323.8 ha or 27.3% of riverside areas.

For the most part, green areas are located in the north-west and south-east of the city, in less urbanized areas. However, the arranged green areas also are in the vicinity of the river in the central parts of Wrocław. A large part of the area, i.e. 13.2% (156.5 ha), is occupied by public transport, infrastructure, and internal communication.



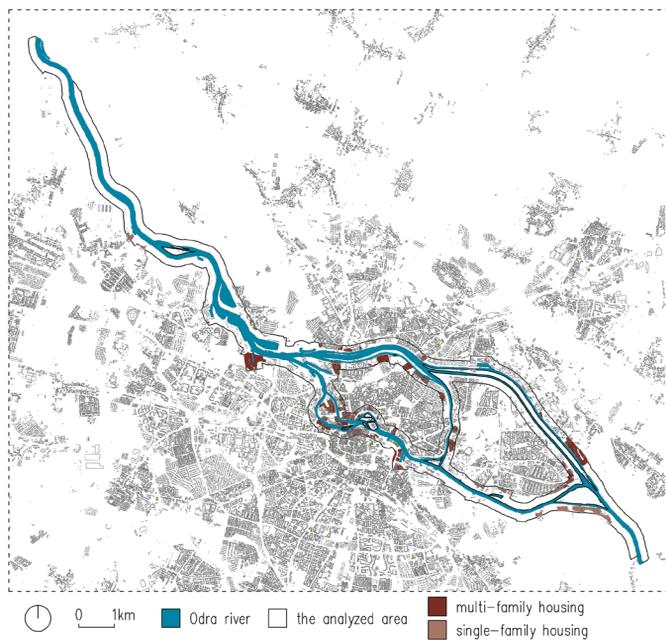
**Fig. 5.** Green areas

Source: own study.



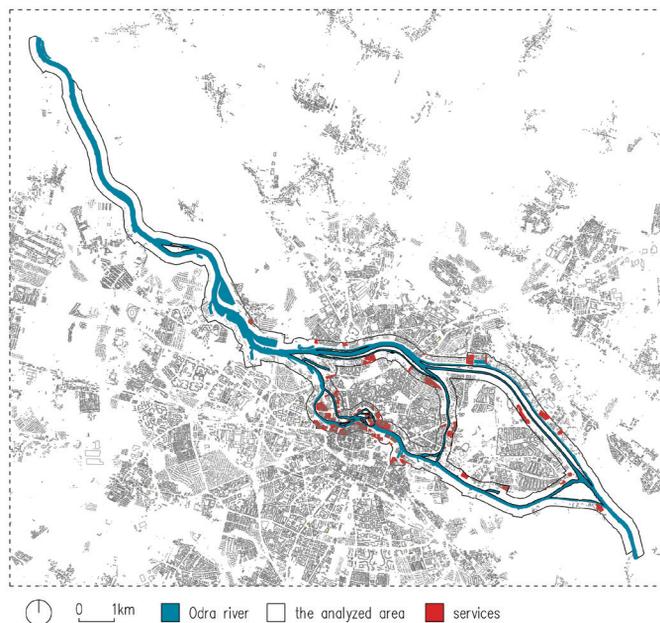
**Fig. 6.** Transport, infrastructure, internal communication

Source: own study.



**Fig. 7.** Residential buildings

Source: own study.



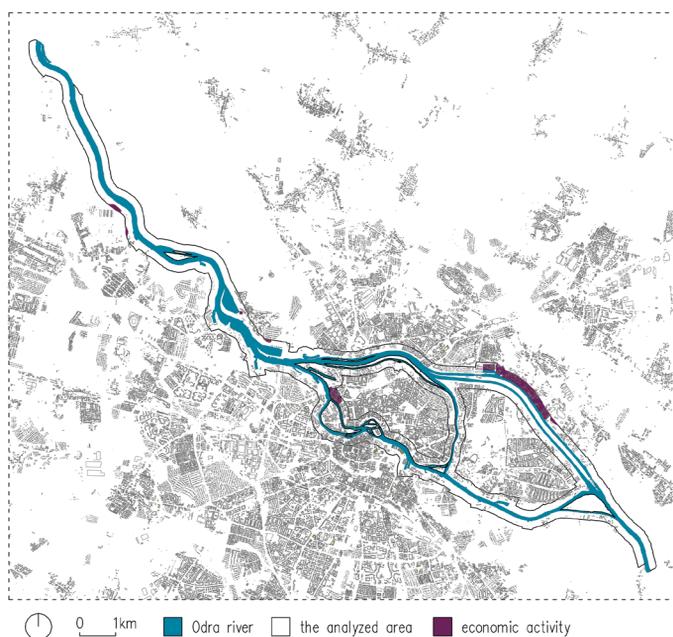
**Fig. 8.** Services

Source: own study.

The greatest intensity of these functions can be observed in the city centre, especially on the southern branch of the Odra. Housing development areas cover 10.7%, including 8.6% multi-family housing (102 ha) and single-family housing – 2.2% (25.9 ha).

Residential buildings predominate in the city centre, partly in the south-eastern part of Wrocław, while the north-western part of the quayside areas is almost devoid of this function. Part of the housing development is connected to services, so the actual development may differ from that planned. Services alone account for 8.1%.

Just like the residential buildings, services are mainly located in the centre and southeast of the city. The areas designated for economic activity cover 5% of the discussed area.



**Fig. 9.** Economic activity

Source: own study.

Most of the areas of economic activity are located in a compact belt in the south-eastern part of the river. In other areas, this function occurs regularly. Only few of them, i.e. 2.8%, are agricultural and other primarily closed areas, e.g. military or police.

These areas are located mainly in the northwest of the riverside. The smallest amount of land is dedicated to sports and recreation – only 26.2 ha is planned for this function, which is 2.2% of the analysed area.



**Fig. 10.** Agricultural lands and others

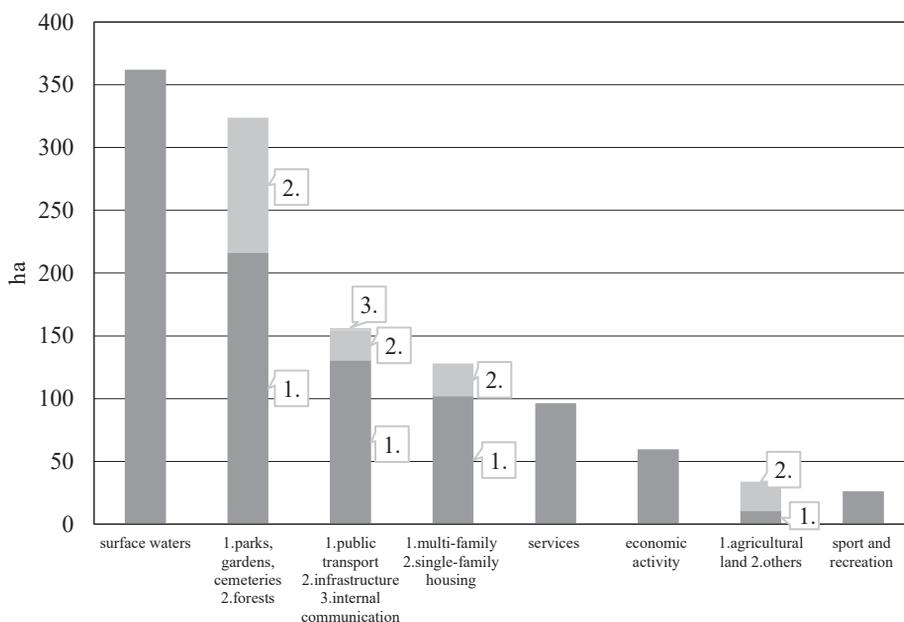
Source: own study.



**Fig. 11.** Sport and recreation

Source: own study.

Most of the land for sports and recreational functions was allocated to the strip on the border of the central and south-eastern part of the Odra.



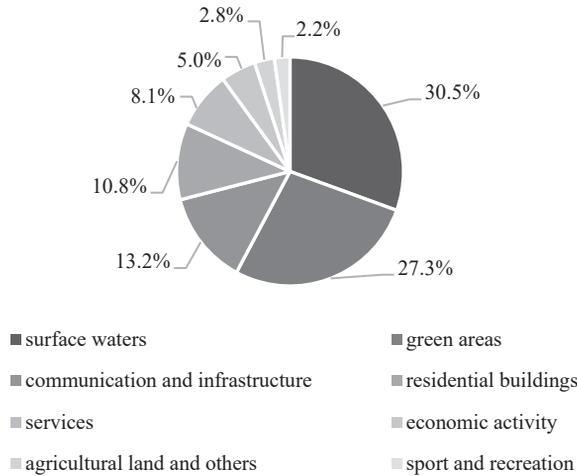
**Fig. 12.** Functions planned on the riverside areas of the Odra in Wrocław, in a 200 m strip

Source: own study.

To summarise, most of the area is intended for surface water, which is often combined with another function. In second place is allocated for widely understood green areas – parks, allotment gardens, cemeteries, and woodland. Next, areas intended for transport and infrastructure and residential areas for single-family and multi-family housing. Fewer than 100 hectares are occupied by areas intended for services, economic activity, agriculture and other, and sports and recreation.

## 5. Discussion

The river in Wrocław is important as it constitutes a significant part of the urban fabric. The separate river policy included in Study and the degree of the coverage of the Odra by the local spatial development plans prove that it is essential for city decision-makers to manage the river resource in a planned and deliberate manner. The planned spatial development of the Odra riverside corresponds to the assumption of the Study – it is multifunctional. However, the functions of surface waters (which result from the essence of the river) and green areas have a decisive advantage.



**Fig. 13.** Percentage of planned functions on the riverside areas of the Odra in Wrocław, in a 200 m strip  
Source: own study.

Many of the green areas surrounding the Odra are located in poorly urbanized areas, potentially not very accessible to residents. Nevertheless, green areas near the river, even if inaccessible to the inhabitants, are significant for the city's development. They constitute an element of the blue-green infrastructure, which is a response to ineffective traditional flood protection (the grey segment of the infrastructure). The infrastructure marked blue-green assumes such management of green areas that will allow for the natural dispersion of excess water. These are activities covering, among other things, allocating some areas for flooding, leaving wetlands, or introducing various types of urban green areas (Ecological Institute and Fundacja Sendzimira, 2019; The European Environment Agency, 2019). An essential feature of the river is its linearity, which allows for the creation of functional sequences. In Wrocław, a series of green areas is planned, which is particularly developed on the right bank of the north-western part of the Odra river. The development of this structure would fit in with the idea of the Wrocław Green Network, already described in 2014. This concept assumes the connection of urban green areas so that from each park, woodland, or recreational area, it is possible to reach another similar object via green links (Sikora, 2014). The river is a natural corridor with many recreational areas not marked in the local development plan. Formalizing their presence would allow for more efficient management of these areas and would also positively impact on the city's image. Green areas predominate in the north-western part of the riverside and have one of the few functions located in this part of the city. When analysing the arrangement of individual functions, it can be observed that agricultural and other areas that restrict the inhabitants' access to the river are located in the zone

of the moderately intensified development, and most of them occur in the centre and the southeast. In these areas, residents have the most developed communication infrastructure and access to services. The most extensive strip of economic activity is also located near the centre. Economic activity is a designation not officially adopted in the ordinance (Rozporządzenie Ministra Infrastruktury z dnia 26 sierpnia 2003 r. w sprawie wymaganego zakresu projektu miejscowego planu zagospodarowania przestrzennego), which specifies the requirements for the design of local development plans. Economic activity often blends with other destinations under discussion plans, mainly services and production. Surprisingly few riverside areas (2.2%) were devoted to sports and recreation – this function was also planned mainly in the city centre and the southeast. The city centre is also where most riverside housing developments are located, which undoubtedly facilitates the inhabitants' access to the river. It is noteworthy that most of the locations of residential buildings coincide with the location of green areas, which will probably result in attracting residents to the river for recreational and leisure purposes. At the same time, housing estates constitute a barrier for outsiders, especially if they are fenced. In future research, it would be necessary to analyse the degree of openness of areas with residential buildings to conclude whether they connect the city with water or exclude part of society from convenient access to the waterfront.

## 6. Conclusion

The inhabitants of Wrocław believe that the river in the city is essential, and the riverside areas should be developed in a diversified way. They want access to green areas and appreciate more urbanized embankments with services, especially in the centre.<sup>2</sup> The provisions resulting from the above mentioned study and local plans are consistent with the needs of the residents. The analysis shows that the development of the Odra region is well thought-out and planned. Most of the area is accessible to residents and encourages them to spend time by the river. However, the study assumed a 200 m strip of riverside without considering buildings and structures that would increase the time of reaching the water. When extending the research, it could be analysed what services are available by the river and the degree of openness of residential areas.

---

<sup>2</sup> Interviews were conducted during a survey of the inhabitants of Wrocław on the introduction of the city water tram. The study was conducted in cooperation with the Wrocław Development Office, and the Wrocław City Hall will publish the full report.

## References

- Deloitte Global. (2020). *The Deloitte Global Millennial Survey 2020. Resilient generations hold the key to creating a "better normal"*. Retrieved October 4, 2021 from <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/deloitte-2020-millennial-survey.pdf>
- Ecologic Institute i Fundacja Sendzimira. (2019). *Błękitno-zielona infrastruktura dla łagodzenia zmian klimatu w miastach. Katalog techniczny*. Berlin-Kraków: Fundacja Sendzimira.
- Korwel-Lejkowska, B., & Topa, E. (2017). Dostępność parków miejskich jako elementów zielonej infrastruktury w Gdańsku. *Rozwój Regionalny i Polityka Regionalna*, (37), 63-75.
- LEMITOR Ochrona Środowiska Sp. z o.o. we Wrocławiu [LEMITOR]. (2016). *Środowisko Wrocławia – Informator 2014-2016*. Retrieved October 25, 2021 from <https://www.wroclaw.pl/srodowisko/files/informator-srodowiskowy-2014-2016.pdf>
- Lis, A., Bocheńska-Skałeczka, A., Burdziński, J., Gubański, J., & Walter, E. (2017). Uwarunkowania przestrzenne, prawne i społeczne w aktywizacji terenów nadrzecznych. Model konceptualny. *Research Papers of Wrocław University of Economics*, (467), 154-162. doi:10.15611/pn.2017.467.13
- Ostrowski, W. (1999). *Wprowadzenie do historii budowy miast. Ludzie i środowisko*. Warszawa: Oficyna Wydawnicza Politechniki Warszawskiej.
- Rozporządzenie Ministra Infrastruktury z dnia 26 sierpnia 2003 r. w sprawie wymaganego zakresu projektu miejscowego planu zagospodarowania przestrzennego (Dz.U. 2003 nr 164 poz. 1587)
- Sikora, A. (2014). *Stwórzmy Wrocławską Sieć Zieleni*. Retrieved November 2, 2021 from <https://progg.eu/wroclawska-siec-zieleni/>
- The European Environment Agency. (2019). *Woda w mieście*. Retrieved November 2, 2021 from <https://www.eea.europa.eu/pl/sygnal42y/sygnaly-2018/artykuly/woda-w-miescie>
- Uchwała nr XLIII/1337/09 Rady Miejskiej Wrocławia z dnia 29 grudnia 2009 r. w sprawie uchwalenia miejscowego planu zagospodarowania przestrzennego części zespołu urbanistycznego Doliny Odry w rejonie obrębu Maślice we Wrocławiu
- Uchwała Nr L/1177/18 Rady Miejskiej Wrocławia z dnia 11 stycznia 2018 r. w sprawie uchwalenia Studium uwarunkowań i kierunków zagospodarowania przestrzennego Wrocławia
- Urząd Statystyczny we Wrocławiu [GUS]. (2020). *Ludność*. Wrocław: Urząd Statystyczny.
- Ustawa z dnia 20 lipca 2017 r. – Prawo wodne (Dz.U. 2017 poz. 1566 z późn. zm.)