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## OVERCOMING BARRIERS TO THE USE OF ECOSYSTEM SERVICES FOR SUSTAINABLE DEVELOPMENT OF CITIES IN POLAND

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### POKONYWANIE BARIER W WYKORZYSTYWANIU USŁUG EKOSYSTEMÓW NA RZECZ ZRÓWNOWAŻONEGO ROZWOJU MIAST W POLSCE

**STRESZCZENIE:** Miasta zależą od usług świadczonych przez ekosystemy miejskie i pozamiejskie. Jednak świadomość tego faktu jest relatywnie niska, co prowadzi do degradacji ekosystemów i – w konsekwencji – utraty możliwości korzystania z dostarczanych przez nie usług. Jak wynika z badania przeprowadzonego przez Fundację Sendzimira, problem ten jest w Polsce szczególnie widoczny. W badaniu zwrócono uwagę na instytucjonalne (administracyjne i społeczne) bariery ochrony miejskich ekosystemów. Uzyskano 103 odpowiedzi od ekspertów zajmujących się od strony badawczej i praktycznej zarządzaniem przyrodą w polskich miastach. Najistotniejsze wyłonione w badaniu bariery wiążą się z niedostatecznymi środkami finansowymi i niedostatecznym poziomem świadomości na temat znaczenia ekosystemów i świadczonych przez nie usług. Aby przeciwdziałać tym problemom, Fundacja Sendzimira zrealizowała kampanię promującą koncepcję usług ekosystemów wśród osób odpowiedzialnych za zarządzanie przyrodą w polskich miastach.

**SŁOWA KLUCZOWE:** usługi ekosystemów, świadczenia ekosystemów, ekologia miasta, edukacja dla zrównoważonego rozwoju, TEEB Polska, ekonomia ekosystemów i bioróżnorodności

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## Introduction

The concept of ecosystem services appears more and more frequently in scientific publications and reports aimed at aiding the political decision making process. Two large international undertakings: the Millennium Ecosystem Assessment and The Economics of Ecosystems and Biodiversity (TEEB) have greatly contributed to the popularity of this concept. Similar initiatives have been undertaken in individual countries, towns and other administrative units around the world. The most ambitious of these projects was the UK's National Ecosystem Assessment.<sup>1</sup> One of the main conclusions of research carried out so far is that if people were better informed on the benefits derived from nature, social support for environmental protection would be greater, warranting the support of decision makers.

Experts began to address urban nature in the context of ecosystem services in the 1990s.<sup>2</sup> Separate chapters were dedicated to this topic in all major publications in the field of ecosystem services.<sup>3</sup> Each of these publications emphasised that the quality of life in a city depends not only on urban ecosystems, but also ecosystems surrounding the city which provide food and water, purify the air, create recreational opportunities, etc. Five of the most important issues which typically preoccupy urban decision makers and which illustrate the link between the state of nature and the potential of ecosystems to provide services are: the influence of the environment on health (a basic category of the quality of life); role of urban greenery in spatial planning; mitigating the negative effects of transportation; building social capital; and improving city image.<sup>4</sup>

Although the importance of nature has long been acknowledged also by researchers in Poland,<sup>5</sup> the framework of ecosystem services has not been explored

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<sup>1</sup> UK NEA, *The UK National Ecosystem Assessment: Synthesis of key findings*, UNEP-WCMC, Cambridge 2011.

<sup>2</sup> P. Bolund & S. Hunhammar, *Ecosystem services in urban areas*, "Ecological Economics" 1999 No. 29(2), p. 293-301.

<sup>3</sup> G. McGranahan et al., *Urban systems*, in: *Ecosystems and human well-being: current state and trends (Millennium Ecosystem Assessment, Vol. 1)*, ed. R. Hassan, R. Scholes & N. Ash, Island Press, Washington, D.C. 2005, p. 795-825; H. Robrecht et al., *Ecosystem services in cities and public management*, in: *The Economics of Ecosystems and Biodiversity for local and regional policy makers*, ed. H. Wittmer & H. Gundimeda, TEEB, Leipzig 2010, p. 65-80; L. Davies et al., *Urban*, in: *UK National Ecosystem Assessment: Technical Report*, UNEP-WCMC, Cambridge 2011, p. 361-410.

<sup>4</sup> J. Kronenberg, *Urban ecosystem services*, "Sustainable Development Applications" 2012 No. 3, p. 14-28.

<sup>5</sup> C.f. A. Ptaszycka, *Przestrzenie zielone w miastach*, Ludowa Spółdzielnia Wydawnicza, Warszawa 1950; H.B. Szczepanowska, *Drzewa w mieście*, Hortpress, Warszawa 2001; A. Zachariasz, *Zieleń jako współczesny czynnik miastotwórczy ze szczególnym uwzględnieniem roli parków publicznych*, Wydawnictwo Politechniki Krakowskiej, Kraków 2006.

in this context. However, as the concept of ecosystem services is expected to contribute to better management of economy–society–environment interactions, it is worth exploring also in the Polish context. The Sendzimir Foundation carried out a research project on the barriers to the use of ecosystem services concept in Polish cities, the results of which are briefly reported in the following section. In response to the identified barriers, and in particular in an attempt to enhance the understanding and uptake of the concept in Poland, the Sendzimir Foundation carried out a number of activities, listed in section 3. These complemented other activities carried out with regard to urban ecosystem services in Poland so far. As suggested in the concluding section 4, further activities can be built on those that have been undertaken so far but cooperation is necessary to achieve more significant results.

## Barriers to the use of ecosystem services in Polish cities<sup>6</sup>

In order to learn about the barriers to realising the potential of ecosystem services for urban sustainable development, the Sendzimir Foundation conducted a study on the barriers to preserving city trees. Trees are a particularly common element of urban ecosystems and the benefits that they convey to people are relatively well known.<sup>7</sup> Long-term urban tree maintenance is an obvious prerequisite for sustainable development because it provides an opportunity for future generations to benefit from their services. Therefore, the problems related to preserving urban trees and those hindering the use of urban ecosystem services should have a common origin. The focus of the study was on trees growing along streets, within housing estates and next to buildings since these are the most visible elements of urban ecosystems, and at the same time the most exposed and least protected from the negative impacts of urban activity. The study concentrated on large cities, with a population exceeding 100,000 residents, but also encompassed towns of 50,000 – 100,000 residents.

Most debates concerning urban tree-related issues refer to the phenomena hindering tree growth which are related to transport and infrastructure development (e.g. soil salinity and hardening, air pollution, lack of space for root systems).<sup>8</sup> Our study sought to understand where these problems originate. Why is it that nature's potential to support urban development and increase quality of life is not exploited? Aiming to answer such questions, this study began by iden-

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<sup>6</sup> For a more detailed overview of the study, see: J. Kronenberg, *Barriers to preserving urban trees and ways of overcoming them*, "Sustainable Development Applications" 2012 No. 3, p. 31-49.

<sup>7</sup> Nevertheless, we keep being surprised by the positive impacts of trees. A recent study discovered that urban greenery absorbs 8 times more pollutants than previously thought: T.A.M. Pugh et al., *Effectiveness of Green Infrastructure for Improvement of Air Quality in Urban Street Canyons*, "Environmental Science & Technology" 2012 No. 46(14), p. 7692-7699.

<sup>8</sup> C.f. H.B. Szczepanowska, op. cit.

tifying the institutional (both administrative and social) barriers to preserving or increasing the number of trees in the centres of Polish cities. The study also attempted to find ways of removing these barriers so that trees can begin to be more consciously used for the benefit of sustainable urban development in Poland.

The notion of institutional barriers has been taken from institutional economics.<sup>9</sup> Administrative limitations encompass a lack of appropriate policies, strategies or other actions that could solve a given problem; problems with actions that have been undertaken (e.g. inappropriate goals or tools); and problems with policy implementation due to inappropriate actions on the part of public officials. In short, these limitations stem from a lack of appropriate administrative actions, which in turn may result from a lack of appropriate knowledge or institutional possibilities. Social limitations are associated with a lack of social mobilization or empowerment to act, in other words the failure to include society in decision making (aka social participation).

The survey was carried out in 2011. It was based on individual questionnaires and respondents were experts in issues related to urban trees in Poland. The sample was chosen deliberately so as to include individuals who actively take part in debates in this field. Of 103 complete responses, 59 came from local administration officers, 37 from researchers, 5 from private sector employees, and 2 from other experts. Notably, the average number of years of experience in the field of urban greenery among participants was 13.5.

The number one administrative barrier is insufficient funds for the maintenance of green areas (Figure 1). Another obvious barrier to preserving trees and nature in cities is the low prevalence of localised spatial management plans in most large cities in Poland, which means that decisions on urban development are based on subjective criteria. Half of the six most important barriers were associated with inappropriately carried out tree and shrub maintenance activities. Other barriers were associated with unclear policy: regulations that downplay the significance of greenery or limit the possibilities for taking action to protect it in cases of conflict with other interests (e.g. infrastructure development). A clear preference for other interests in major legal documents unrelated to environmental protection limits public officials' action in protecting nature. Many of the identified barriers linked directly to poor understanding of ecosystem services. A prominent example was the perceived lack of economic interest associated with urban tree protection, which reflects the dominant way of thinking about city trees among the Polish decision makers. This was linked with two other barriers: neglect for the benefits (services) provided by trees in towns' and cities' economic accounts, and a lack of awareness of the importance of trees among decision makers. Furthermore, the lack of incentives which could encour-

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<sup>9</sup> J.B. Opschoor, *Institutional change and development towards sustainability*, in: *Getting Down to Earth: Practical Applications of Ecological Economics*, eds. R. Costanza, O. Segura & J. Martínez-Alier, Island Press, Washington, D.C. 1996, p. 327-350; *Challenges of Sustainable Development in Poland*, eds. J. Kronenberg & T. Bergier, Sendzimir Foundation, Krakow 2010, p. 23-25, [www.sendzimir.org.pl/textbook](http://www.sendzimir.org.pl/textbook) [Date of entry: 10-09-2012].

age appropriate behaviour, including regulations to support the development of greenery in Polish cities, was also highlighted.

Among social barriers, the most important one was that society perceives other issues, such as parking spaces and new buildings, as more pressing than preserving trees (Figure 2). According to respondents, the second most important barrier was residents perceiving trees as a problem, which in particular refers to shade, allergies and the cleaning up of leaves. The third most significant barrier was a lack of awareness of the importance of trees for quality of life. Whilst there are both supporters and opponents of trees, the arguments of opponents are often more persuasive in society. This relates to neglect for public space in Poland and more importantly a lack of awareness that things could look different. The fourth most important barrier – individuals' bad habits – refers mainly to unprofessional tree maintenance by private individuals whose actions are often unauthorised, as is typically the case with tree topping. However, people who wish to protect trees from these and other types of pressure are often not familiar with the possibilities and methods of counteracting damage done to trees in their neighbourhood. Residents usually do not know where to report such cases, and the institutions that they turn to are often unwilling to assist, which quickly discourages them from taking further action. The "trees have always been and always will be" type of thinking, which ranked sixth, assumes that no matter what people do, trees will remain a permanent element of the landscape. The fact that town residents fail to notice trees is associated with the relatively high prevalence of trees, but also most likely a lack of interest in nature. It is not surprising then that households do not include tree services in efficiency analysis (such as reduced energy consumption due to trees protecting sites from wind or sunlight or the positive influence of trees on real estate value).

Proposed routes for action correspond to the identified barriers. Respondents chose guaranteeing higher funds for urban greenery maintenance as their number one solution (Figure 3), which corresponds to the financial barrier identified as the main administrative barrier. Effective law enforcement and execution of properly carried out work match the other respective administrative barriers. Respondents also found clearing up legal acts necessary, such as removing incoherent provisions and clarifying imprecise phrases. A thorough review of relevant legislature is needed that takes into account new knowledge on ecosystem services and their significance in sustainable development of towns and cities and the country as a whole. The achievement of these goals requires social support. The key issue is raising awareness among residents and explaining to them why these actions are so important, so that they become the allies, instead of the opponents of urban nature protection. Information and education are therefore essential to put pressure on politicians to make the relevant legislation more effective. These two issues, closely related to preserving trees in cities, are also key to increasing the involvement of individuals in nature protection and care for public space. Given the commonly perceived lack of economic justification for urban tree protection, popularisation of the ecosystem services concept could play a crucial role. The benefits conveyed by nature do have an

Figure 1.  
The number of indications of different institutional barriers to preserving urban trees according to their ranking (N = 293, respondents were asked to identify the 3 most important barriers)

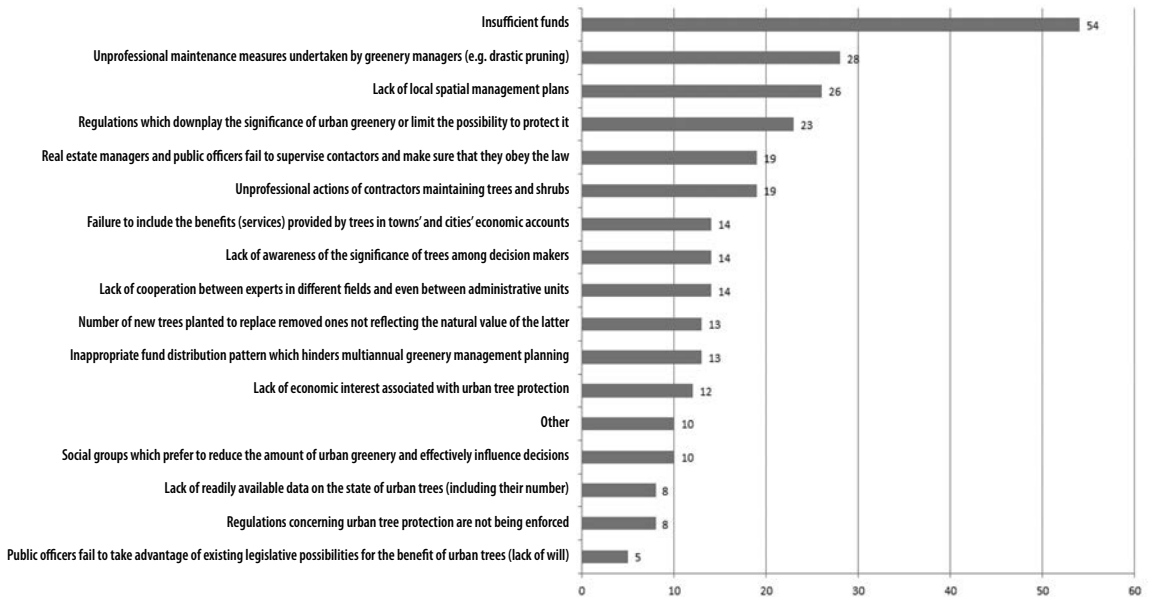


Figure 2.  
The number of indications of different social barriers to preserving urban trees according to their ranking (N = 285, respondents were asked to indicate the 3 most significant barriers)

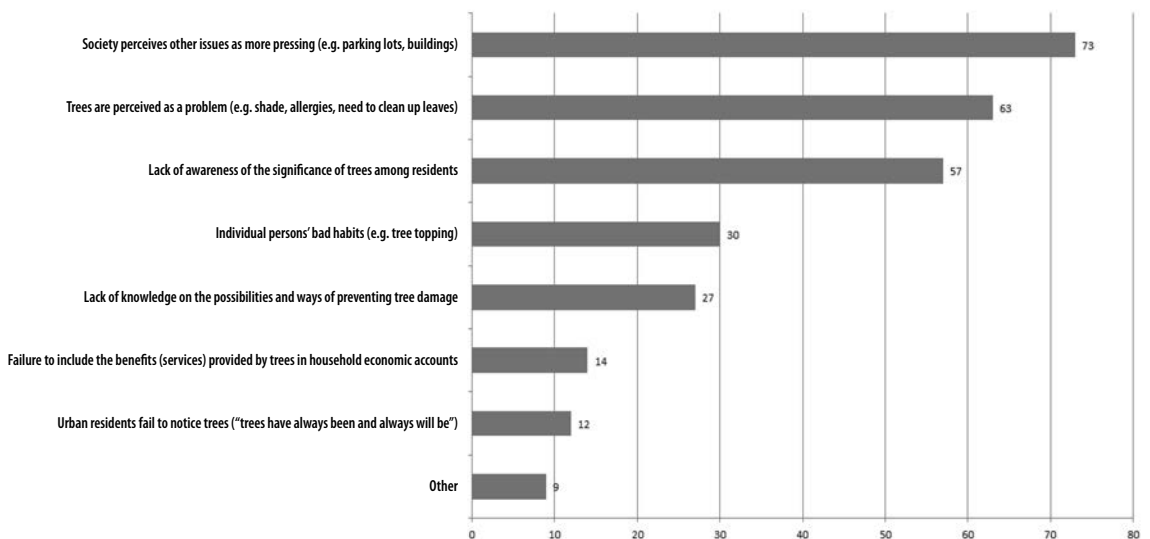
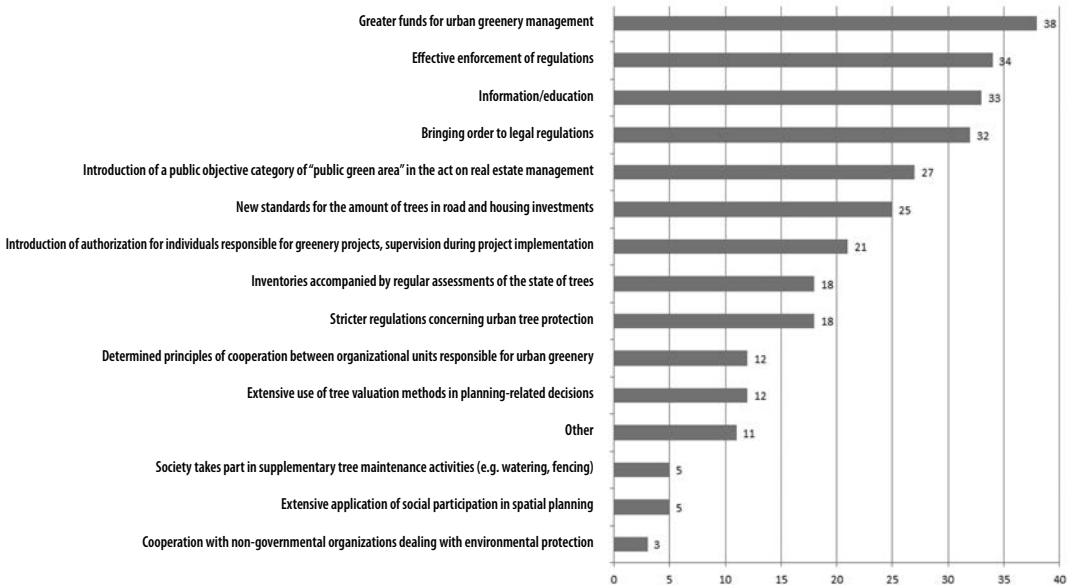


Figure 3.

The number of indications of different ways of overcoming barriers to preserving urban trees according to ranking (N = 300, respondents were asked to indicate the 3 most significant ways of overcoming barriers)



economic dimension and can be compared favourably with the costs of protection. Nature degradation and the associated loss of its services presents an opportunity cost which must be included in financial feasibility analyses of specific actions.

The above findings clearly indicate a need for awareness raising activities to be carried out by various stakeholders, including the government, local and regional authorities, NGOs, research institutions, individuals and international organisations. It is within this framework that the Sendzimir Foundation carried out the project entitled "Ecosystem services for sustainable development of cities".

### **"Ecosystem Services for Sustainable Development of Cities" project**

The Sendzimir Foundation's project "Ecosystem Services for Sustainable Development of Cities" was carried out in the years 2011 and 2012. It included a number of activities aimed at promoting the concept of urban ecosystem services in Poland, the most important of which are briefly described below. Thus, project activities focused on alleviating the above identified barriers linked directly to poor understanding of ecosystem services. The project was carried out with formal endorsement of ICLEI – Local Governments for Sustainability, an international association of local authorities, as well as the Ministry of Environ-

ment, the Union of Polish Metropolises, and the Mayor of Lodz and the Marshal of Lodz Region.

Several of our activities concentrated in Lodz. This city is a particularly interesting case because it developed rapidly in the 19<sup>th</sup> century as the most important centre of the Polish textile industry and one of the largest textile manufacturers in Europe. One of the main reasons for the development of the city was a network of rivers and streams and wood resources that provided both water and energy required by the industry. However, although the city grew because of ecosystem services, today ecosystem services seem not to be a priority for city authorities and inhabitants. And Lodz is widely perceived as neglected, unattractive and unhealthy. Yet, Lodz was a candidate city for the 2012 and 2013 European Green Capital Awards and the fact that local and regional authorities agreed to endorse the Sendzimir Foundation's project provides an important political signal that the issues related to ecosystem services become important and that it will be possible to consider the findings of our project in local decisions and to build general awareness.

## International conference at the University of Lodz

In July 2011, the Sendzimir Foundation, together with the University of Lodz, organised an international scientific conference on the value of urban ecosystem services. The conference was attended by participants from 20 countries, including globally recognised researchers. Keynote presentations were given by professors Jürgen Breuste, Dagmar Haase, and Åsa Jansson. Although the main objective of the conference was to exchange information and ideas and thus contribute to building the body of knowledge on urban ecosystem services, an important side objective was to promote the concept of ecosystem services in Poland and in particular in the host city of Lodz. For the latter reason, representatives of city authorities and other local stakeholders were invited to take part in the conference. A special local case study session was organised to seek advice from external experts on how to improve the management of ecosystem services in Lodz and to use a case study of Lodz to debate the problems of urban ecosystem services.

The discussions focused on ecosystem services at different levels penetrating the urban content: inner city, greater city and city–region interactions. The presentations linked to services provided by allotment gardens, urban parks, the sea, green roofs and other elements of urban nature. They referred to indicators, valuation and governance issues. Selected papers have been published in the special issue of *Landscape and Urban Planning*.<sup>10</sup>

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<sup>10</sup> K. Hubacek, J. Kronenberg, *Synthesizing different perspectives on the value of urban ecosystem services*, "Landscape and Urban Planning" 2013 No. 109(1), p. 1-6.



The conference included a field trip presenting the concept of the Blue-Green Network that is being promoted in Lodz by the European Regional Centre for Ecohydrology.<sup>11</sup> Interestingly, the Blue-Green Network incited significant interest among the participants, providing yet another argument for local authorities to appreciate the economic and social potential of good management of ecosystem services.<sup>12</sup>

## Workshops in Lodz and report for the city

In 2011, the Sendzimir Foundation organised its international Summer Academy “Challenges of Sustainable Development” in Lodz. One of the two elements of the Academy is the practical Local Sustainable Development Project within which participants work on a selected problem, based on real-life experience and meetings with local stakeholders.<sup>13</sup> In 2011, the Local Project focused on to how to employ the concept of urban ecosystem services to enforce sustainable development of Lodz. In a mutually supportive process, a series of workshops was organised within which the Academy participants assisted local stakeholders in solving the related problems, and the local stakeholders supported the participants in their work.

The participatory workshops were organised in cooperation with the Lodz City Office and referred to the importance of green areas in Lodz. The numerous and diverse group of stakeholders, together with the Academy participants, analysed the potential of Lodz to receive the title of the European Green Capital, as well as methods and activities to increase this potential by 2020. Indeed, Lodz had already applied for this title in 2010 but the application was unsuccessful. The outcomes of the workshops and other findings of the Local Project were described in the report, prepared by the Academy participants, which was presented to the Lodz City Office and is available in Polish and English at the Sendzimir Foundations’ website.<sup>14</sup>

<sup>11</sup> C.f. I. Wagner & M. Zalewski, *Ecohydrology as a basis for the sustainable city strategic planning: focus on Lodz, Poland*, “Reviews in Environmental Science and Bio/Technology” 2009 No. 8(3), p. 209-217.

<sup>12</sup> More information, along with presentations from the conference, can be found at: <http://www.sendzimir.org.pl/seminar2011> [Date of entry: 10-09-2012].

<sup>13</sup> T. Bergier, J. Kronenberg, K. Maliszewska, *Szkoła letnia „Wyzwania zrównoważonego rozwoju w Polsce” – dwanaście lat doświadczeń*, in: *Edukacja dla zrównoważonego rozwoju: Główne problemy*, ed. T. Borys, Wydawnictwo Ekonomia i Środowisko, Białystok-Wrocław 2010, p. 393-405.

<sup>14</sup> O. Baltina et al., *Lodz as European Green Capital by 2020*, Sendzimir Foundation, Lodz 2011, <http://www.sendzimir.org.pl/sites/default/files/Report%20Lodz%20as%20European%20Green%20Capital%20by%202020.pdf> [Date of entry: 10-09-2012].

## Coalition for Sustainable Development of Lodz

As a follow up to the above activities, the Sendzimir Foundation has initiated the Coalition for Sustainable Development of Lodz. The Coalition is meant to comprise organisations, companies and institutions which represent the three socio-economic sectors and are interested in collaborative action on the city's sustainable development. The idea is based on similar coalitions operating in other cities, such as Brighton and Hove City Sustainability Partnership, San Diego Regional Sustainability Partnership, or Dearborn Sustainability Coalition.

Towards the end of 2011, the newly created Coalition took active part in public consultations of the development strategy of Lodz. The draft "Integrated Development Strategy Lodz 2020+" that had been presented by city authorities did not include any reference to environmental protection. As a result of several discussions held by the Coalition's members, a statement was prepared commenting on the shortcomings of the municipal document. One of the ideas highlighted in that statement concerned the need to refer to ecosystem services, along with explanations why the Coalition's members considered this necessary.

The statement was then circulated among other stakeholders and presented during a conference organised before the beginning of public consultations. The ideas from the statement permeated through the society and surfaced in almost all of the six groups working independently during public consultations organised by the city office. Eventually, the whole structure of the strategy was changed and ecosystem services have been included into the final document adopted in June 2012.

Active involvement of city inhabitants proved crucial in highlighting the importance of ecosystem services to city authorities, illustrating how barriers related to regulations that downplay the importance of urban greenery can be overcome. Indeed, the subsequent "Municipal and Environmental Protection Policy", presented by the city office later in 2012, made very important references to ecosystem services and attempted to put many other environmental issues in order.

## "Nature in the City" – Polish TEEB guide for cities

The guide "Nature in the City",<sup>15</sup> published as the third volume of "Sustainable Development Applications" journal, focuses on the application of ecosystem services for the benefit of urban sustainable development. It is aimed primarily at local government representatives responsible for spatial planning, infrastructure, transport, strategic planning and of course development, and indeed anyone else whose decisions will have a bearing on urban ecosystems.

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<sup>15</sup> *Nature in the city. Ecosystem services – untapped potential of cities. Polish TEEB Guide for Cities, "Sustainable Development Applications" 2012 No. 3, ed. T. Bergier, J. Kronenberg, <http://www.sendzimir.org.pl/en/journal3> [Date of entry: 10-09-2012].*

The first article concerns the basics of urban ecosystem service management, its main goal is to raise awareness of the subject, especially by presenting why it is worthwhile to deal with urban nature and what kind of benefits it provides. The second article presents the results of research on barriers, briefly reported above, in section 2. The third article deals with the issue of public participation in decision making on urban nature, and includes advice on how to prepare and carry out an efficient participatory process. The fourth article refers to the methods of assessing the value of urban nature, and includes the results of a valuation study carried out in Lodz. Within a choice experiment, the residents of stated how much they would be willing to pay for increasing the number of trees in the city centre. The fifth article concerns urban water ecosystems and their services, such as flood protection, recreation, microclimate and space aesthetics. All articles in the guide are accompanied with the numerous examples from Poland and abroad, and there is an additional section featuring 12 best practice case studies of urban ecosystem services management. This section presents how cities can take advantage of the potential of ecosystem services, what kinds of economic and legal mechanisms can be used for this purpose, and what is the role of non-governmental organisations and other stakeholders in this respect.

The guide was inspired by activities carried out within the international TEEB project (The Economics of Ecosystems and Biodiversity). The Sendzimir Foundation received official approval from the TEEB project coordinators for this initiative, and consent for this guide to be called the first TEEB initiative in Poland, hence the title “Polish TEEB for Cities” and the unique Polish TEEB logo (Figure 4).

Figure 4.  
Logo created for the “Polish TEEB Guide for Cities”



## “TEEB Manual for Cities” in Polish

The Sendzimir Foundation published a Polish translation of the “TEEB Manual for Cities”, comprising the main conclusions of the TEEB project from the perspective of applying ecosystem services concept in urban management. The “TEEB Manual for Cities” had been produced within the international TEEB project and it synthesised the findings of the larger “TEEB for Local and Regional Policy Makers” report published in 2010. Using examples from across the world, the manual presents a 6-stage approach which makes it possible to include ecosystem services in the policies and decision making processes in city planning. The six steps include:<sup>16</sup>

1. specification and agreement on the problem or policy issue with stakeholders;
2. identification the most relevant ecosystem services that can help to solve the problem or policy issue;
3. determining what information is needed and selecting assessment methods;
4. assessment of future changes in ecosystem services;
5. identification and comparison of management/policy options;
6. assessment of the impacts of the policy options on the range of stakeholders.

The manual puts much emphasis on economic valuation of urban ecosystem services and presents numerous case studies where different valuation methods were used to support urban management. Interestingly, many case studies originate from developing countries, where projects related to urban ecosystem services were often carried out with foreign aid. These undertakings were successful enough for cities in other countries to be able to learn from them. From the Polish perspective it is particularly important that the concept of ecosystem services is used both in developing and developed countries, demonstrating that ecosystem services are equally important in all contexts. Thus, the publication of this manual in Polish is meant not only to increase awareness of ecosystem services in our country, but also to undermine the current preference for other interests, apparent in both legal documents and social attitudes.

## Discussion and conclusions

The activities presented here were undertaken in response to the findings of the study on the barriers to the use of the concept of ecosystem services in Polish towns and cities. They were meant to serve as an inspiration for further activities to be undertaken by other stakeholders and eventually to contribute to better

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<sup>16</sup> TEEB, *Poradnik TEEB dla miast: usługi ekosystemów w gospodarce miejskiej*, wydanie polskie, Sendzimir Foundation, Kraków 2011.

management of urban nature in Poland. At the same time, the Sendzimir Foundation discussed the issue of urban ecosystem services at the European Union level, taking part in an international network of non-governmental organisations committed to making European cities greener. Lobbying is necessary, along with joint efforts of various stakeholders. All of these activities focused primarily on increasing awareness of the concept of ecosystem services among various stakeholders involved in urban management in Poland. To broaden the outreach of these activities, both guides ("Nature in the City" and the "TEEB Manual for Cities") are available free of charge from the Sendzimir Foundation's website.

These publications add to a number of other books and articles on urban nature published in Poland so far. With regard to popularising the concept of ecosystem services, one of the most important initiatives was a special issue of "Ekonomia i Środowisko" focused entirely on this topic.<sup>17</sup> However, with the exception of one article,<sup>18</sup> the special issue neglected the urban or peri-urban context. Similarly, out of several other Polish publications on ecosystem services,<sup>19</sup> few referred to cities. Szumacher<sup>20</sup> discussed relationships between ecosystem functions and services in cities. Kostecka<sup>21</sup> focused on the potential of ecosystem services concept to help protect birds in cities. Bernaciak<sup>22</sup> looked at the importance of ecosystem services for quality of life in cities and the challenges that it poses for spatial planning. Nevertheless, most of the publications on ecosystem services available in Poland so far remain rather academic. To increase the impact of such research, more popular publications are necessary, along with those that link researchers with decision makers and thus facilitate the diffusion of new ideas among practitioners.

Experience gained in discussing urban nature from a more general perspective within a series of conferences organised by the Polish Association of Sanitary Engineers and Technicians, and attended by both researchers and practitioners provides a good example. The title of this series indicates that urban greenery is the wealth of a city ("Zieleń miejska – naturalne bogactwo miasta"), obviously

<sup>17</sup> C.f. A. Mizgajski, Świadczenia ekosystemów jako rozwijające się pole badawcze i aplikacyjne, "Ekonomia i Środowisko" 2010 No. 37, p. 10-19.

<sup>18</sup> D. Łowicki, Wartość krajobrazu w świetle cen terenów pod zabudowę w latach 1995-2000, "Ekonomia i Środowisko" 2010 No. 37, p. 147-156.

<sup>19</sup> E.g. J. Solon, *Koncepcja „Ecosystem Services” i jej zastosowanie w badaniach ekologiczno-krajobrazowych*, "Problemy Ekologii Krajobrazu" 2008 No. 21, p. 25-44; Z.M. Rosin et al., *Koncepcja świadczeń ekosystemowych i jej znaczenie w ochronie przyrody krajobrazu rolniczego*, "Chrońmy Przyrodę Ojczyzn" 2011 No. 67(1), p. 3-20; A. Michałowski, *Ecosystem Services in the Light of a Sustainable Knowledge-Based Economy*, "Problemy Ekorozwoju – Problems of Sustainable Development" 2012 No. 7(2), p. 97-106.

<sup>20</sup> I. Szumacher, *Funkcje terenów zieleni miejskiej a świadczenia ekosystemów*, "Prace i Studia Geograficzne" 2011 No. 46, p. 169-176.

<sup>21</sup> J. Kostecka, *Edukacyjne znaczenie pojęcia świadczenie ekosystemów dla ochrony awifauny miast*, "Inżynieria Ekologiczna" 2010 No. 22, p. 34-42.

<sup>22</sup> A. Bernaciak, Środowiskowe uwarunkowania polityki przestrzennej, in: *Zarządzanie przestrzenią miasta*, ed. M.J. Nowak, T. Skotarczak, CeDeWu, Warszawa 2012.

highlighting the importance of nature and the benefits that it provides.<sup>23</sup> Such a forum of exchange of opinions and good practices offers an opportunity to discuss new solutions in a realistic manner, taking into account the barriers related to the functioning of public institutions.

Nevertheless, the state of urban greenery in Poland has been deemed as bad already for a long time. More than six decades ago, Ptaszycska<sup>24</sup> wrote that the state of greenery in post-war Polish towns and cities was by far unsatisfactory, pointing to the lack of funds, and the shortcomings of relevant legal acts and local regulations as well as their interpretation. She also noted “the appreciation of urban greenery rousing too slowly in society in a sea of other worries and the hardships of everyday life, accompanied by a lack of need for order and aesthetics in the immediate surroundings of town residents”. At the time, solutions similar to the ones mentioned in this article were also proposed. However, long-term persistence of barriers has contributed to a constant decline in tree numbers in the centres of Polish cities, limiting the possibilities for their sustainable development. Therefore, urgent actions are needed by public administration officials (who should have greater knowledge than the rest of society) in collaboration with scientific bodies, non-governmental organisations and other stakeholders.

The international conference, workshops in Lodz and the Coalition for Sustainable Development of Lodz, mentioned in section 3, facilitated direct involvement of public administration officials and other stakeholders. These activities raised significant interest and suggest that such cooperation is possible and may bring good results. Another important example of such an activity in Lodz was the 5<sup>th</sup> SWITCH project conference “Sustainable Water management Improves Tomorrow’s Cities’ Health” organised in October 2010. Lodz was one of the case study cities within the EU-funded SWITCH project that focused on sustainable integrated urban water management in the “City of the Future”. The conference was held at Lodz City Office which increased the rank of this event and facilitated the spread of ideas among practitioners.

In the future, other – more diverse and complex – activities need to be carried out to promote better management of urban nature in Poland, including research projects combined with practical solutions; down-to-earth activities, such as tree planting; educational and awareness-raising activities; cooperation with international stakeholders, such as ICLEI; and many others. Above all, to increase their impact, these activities need to be taken in a more coordinated way, as joint projects involving more partners coming from different backgrounds. A common platform for undertaking, presenting and discussing such activities is necessary, and one more effect of the Sendzimir Foundation’s activity – the website on ecosystem services: [www.uslugiekosystemow.pl](http://www.uslugiekosystemow.pl) provides a potential tool to facilitate such exchange.

<sup>23</sup> See e.g. *Zieleń miejska – naturalne bogactwo miasta: lasy w miastach Unii Europejskiej – zasady gospodarowania i ochrona*, eds. E. Oleksiejuk & A. Jankowska, Polskie Zrzeszenie Inżynierów i Techników Sanitarnych, Toruń 2007.

<sup>24</sup> A. Ptaszycska, op. cit., p. 50-53.

## Acknowledgments

Funding from the Deutsche Bundesstiftung Umwelt and the National Fund for Environmental Protection and Water Management (NFOSiGW) is gratefully acknowledged. We would like to thank the TEEB project coordinators for supporting our efforts.