

# Chapter 17

## The Challenge of Innovation Diffusion: Nature-Based Solutions in Poland

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**Abstract** Nature-based solutions (NBS) are currently seen and discussed as innovations, including within the European Commission. We assume that this should result in their broader popularity and implementation in EU countries. We analyse the diffusion of NBS in Poland, a post-socialist country, in the case of which less has been written on NBS and urban green and blue infrastructure than in West European countries. In spite of the above assumption, we indicate that the rate of NBS acceptance in Poland is relatively low and their visibility is limited. Our study uses Amoeba, a tool for understanding, mapping and planning for innovation diffusion and cultural change processes to understand the reasons for this situation and to seek the methods of its improvement. We focus on two case studies, green roofs and ecological corridors, and analyse the roles played by different stakeholders, their attitudes towards these innovations and their influence on NBS diffusion in Poland, as well as the interactions between them.

**Keywords** Diffusion of sustainability innovations • Stakeholder analysis • Urban green infrastructure • Green roofs • Ecological corridors

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## 17.1 Introduction

Nature-based solutions (NBS) are promoted by the European Union as an innovation meant to solve many societal problems. As a supposedly new idea, an innovative solution to outstanding problems, they are being promoted by the European Commission's Directorate-General for Research and Innovation which is responsible for defining and implementing European Research and Innovation policy. The European Commission and its experts (2015) argue that NBS fit well into the dominant discourse on 'sustainable and green growth' that NBS are cost-effective and that they offer a business opportunity for European companies to take the lead in this area in international markets.

If EU authorities see NBS as a window of opportunity not only to protect the environment but also – or perhaps principally – to improve business prospects and the position of the EU in international markets, then we can assume that this approach will be further reflected in national policies and on-the-ground management in EU countries. However so far, the EU discourse on NBS seems to have attracted relatively little attention in Poland (Kronenberg 2016). Indeed, Poland, which is one of the new post-socialist EU members, with an economy which has undergone a radical transformation, often reveals many differences in how new concepts and political ideas spread, compared to the relatively better known Western democratic countries (Kronenberg and Bergier 2012).

In this chapter we aim to address the following research questions: why the concept of NBS is so slowly accepted in Poland, what factors and drivers control the process of its diffusion, and what are the challenges and opportunities to promote it further? To realise these goals, we use Amoeba – a tool developed by Alan AtKisson to analyse the dynamics of cultural changes leading to the widespread acceptance of the innovation, especially those connected with sustainable development (AtKisson 2009). We explain the broader context of NBS in Poland and apply Amoeba to two examples – green roofs and ecological corridors. Finally, based on our analysis, we draw broader conclusions regarding further opportunities to promote NBS in Poland.

## 17.2 Method

While analysing the dynamics of innovation diffusion, it is crucial to understand the roles played by the different stakeholders, their interests and reasons why they promote or hinder an innovation, as well as interactions between them. To successfully transform an innovation to the mainstream, it has to be accepted by the public (mainstreamers); however the mechanisms leading to this shift are very complex, and some social groups have the crucial role in this process (e.g. leaders, celebrities, early adopters). To describe and study the process of NBS acceptance in Poland, we decided to use the method called Amoeba (AtKisson 2009), which was designed for such purposes.

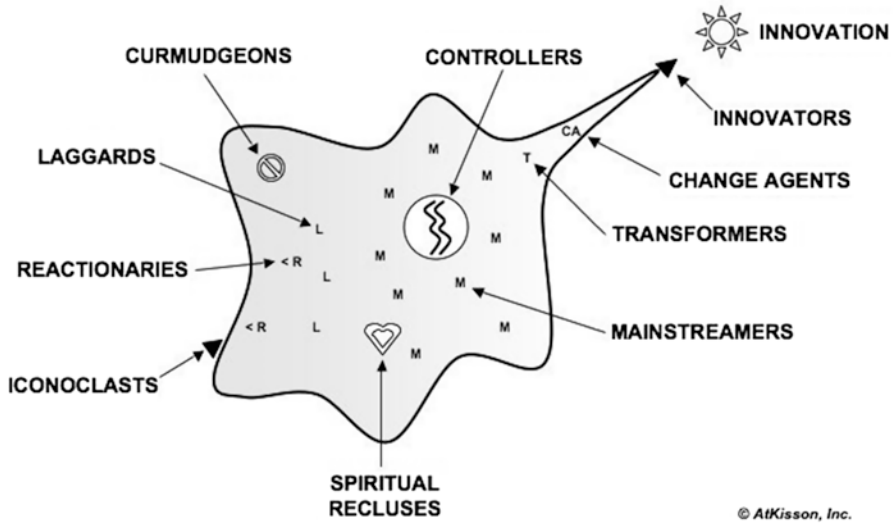
This method uses the metaphor of an amoeba to describe and understand the process of innovation diffusion. An amoeba extends a pseudopodium ('false foot') to reach food, the rest of its body is dragged into that direction and it consumes the food item after completely surrounding it. Innovation acceptance by the society follows an analogous pattern: a food item represents an innovation, a pseudopodium – an innovator, who initiates the move of the whole society towards the innovation. However, the innovator alone is too weak and distant to do so; thus the role of change agents and transformers is so important – they mount the innovation into the society and have the power to make the movement more massive. Meanwhile, there are groups who slow down or block the process. The stakeholders and their roles are described in Table 17.1 and shown in Fig. 17.1. The sum of their activities controls the dynamics of innovation diffusion and eventually decides whether an innovation enters the mainstream or is rejected (or stays in a niche). The goal of Amoeba is to better understand the dynamics of these processes, the power balance and interactions between stakeholders. The method could be used to analyse any innovation, and any stakeholder group or their role has no positive or negative connotation (for instance, a sustainability activist could be a reactionary in a case of nuclear energy).

We decided to use Amoeba to analyse the dynamics of NBS acceptance in Poland because it provides a clear structure and makes it possible to map all stakeholders, but also to comprehensively analyse and describe their roles and influence on innovation diffusion. Based on the results of such an analysis, it is also possible to suggest the means of innovation promotion, as well as to identify the crucial

**Table 17.1** Key stakeholders represented in Amoeba and their roles

Name	Description
Innovator	The source of new ideas (e.g. an inventor, a thinker)
Change agents	Translating an innovation into an idea that can sell. Although they remain outside of the mainstream, they know how to communicate with the mainstream (e.g. consultants and marketing specialists)
Transformers	Early adopters of an innovation. They are keen to adopt new ideas and want to promote positive change. However, they would not accept to do so at the expense of their own credibility, position and influence. Hence they only adopt innovations that they feel the mainstream would ultimately adopt
Mainstreamers	Representatives of the majority who are neither for nor against change. They adopt an innovation when they see that 'everybody else' does so
Laggards	A group of mainstreamers who are happy and comfortable with the status quo and who resist change as long as they can (until the mainstream changes); hence they are called late adopters
Reactionaries	Those who have vested interests which can be harmed by an innovation (or at least they think so); thus they actively resist the adoption of an innovation
Controllers	The most influential stakeholders who set the rules in the system. They react to how the system evolves but sometimes they actively shape the evolution of this system

Note that the original Amoeba features more roles – as illustrated in Fig. 17.1 (AtKisson 2009)



**Fig. 17.1** The Amoeba metaphor – roles played by the different stakeholders (Courtesy of Alan AtKisson). For the sake of brevity and simplicity, in this chapter we omitted some of the less important roles. For a full overview, see AtKisson (2009)

alliances. The latter Amoeba's qualities are especially useful when one works on sustainability innovations. The main limitation of this method is its application in the case of a 'fuzzy' situation, especially if one organisation plays different roles in a system (e.g. an NGO is both an innovator and a change agent) – then it could be difficult to decide on how to categorise it.

There are three main sources of information for the Amoeba analyses we conducted in the chapter:

- Own experience and knowledge of the system, gained from several years of research on the diffusion of sustainability innovations in Poland, especially those connected with NBS and green and blue infrastructure, as well as our active participation in some of these processes,
- Desk research, in which we gathered and analysed information on NBS in Poland, mainly from websites and a very limited number of articles and other publications,
- Interviews with stakeholders involved in these processes.

### 17.3 Nature-Based Solutions in Poland

Although environmental protection was far from being a priority in socialist cities and many green spaces were degraded by polluted water or other by-products of industrial activity, green spaces belonged to the most important aspects of urban planning. Then, the free-market economy brought an overarching focus on satisfying

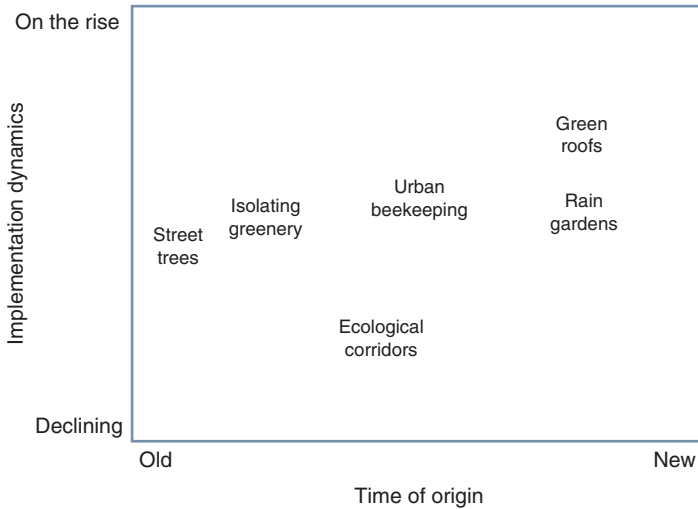
individual needs and freedom to do whatever one wishes on one's land, often coupled with a neglect of public interest. Only in the most recent years, awareness of the broader benefits provided by nature has been rising, and urban green spaces have started to attract increasing attention from the inhabitants and, consequently, from the authorities. Unfortunately, nature is still often seen as a barrier to development, when new investments collide with the remnants of nature, and urban ecosystem dis-services seem to be better known than ecosystem services (Kronenberg 2015).

Examples of what we would now call NBS (i.e. conscious use of nature to help urban inhabitants address various environmental, social and economic challenges) that were implemented already in the socialist period included especially a system of ecological corridors. These corridors were planned as green and other open spaces, which were meant to facilitate air exchange in cities. On a smaller scale, green spaces were used for isolation from noise and pollution and to improve health conditions, especially around hospitals and educational facilities. While efforts have been made by urban planners to protect these corridors and other green spaces, they have been under constant pressure from the expansion of built-up areas. In Poland, such pressures have intensified after the fall of socialism and urban spatial planning has become weakened by a number of deregulatory activities.

Nevertheless, environmental degradation which had taken place in the socialist period paved way for new attempts to rehabilitate some urban rivers and green spaces after the fall of socialism. Several 'renaturalisation' projects have been carried out to improve the condition of urban ecosystems. Some of these have been combined with floodwater management, but most focused on recreational opportunities and aesthetics. However, unlike in the socialist period, green spaces have not been seen as solutions to any specific problems related to urban life, rather as an additional aspect of the broader quality of life in cities.

Most recently, discussions on urban nature have intensified, perhaps because its degradation has achieved thresholds that are no longer acceptable to the society or perhaps because of the international trends which make their way to Poland. For example, street trees are increasingly the source of conflict because more and more often urban inhabitants oppose the fact that city authorities uncritically allow for their removal (NIK 2014; Krynicki and Witkoś Gnach 2016). Although the inhabitants are also not always protecting trees, they are in principle in favour of their preservation and are generally aware of the many benefits they provide (Giergiczny and Kronenberg 2014). Other examples of NBS that are increasingly implemented in Poland include urban beekeeping and green roofs, both of which can be linked to the broader initiatives aiming at urban greening.

To sum up the above overview, NBS have been used already in the socialist period, although not fully consistently and without the modern 'hype' that surrounds this concept. There are many examples of NBS in use in Poland, many of which have been developed in the past and still survive (or even thrive), while others have been introduced recently and are usually on the rise – but at a slow pace. Figure 17.2 presents examples of such solutions and their current standing in Poland, depending on their time of origin (by 'old' we mean those developed already in the socialist period and 'new' have only been introduced recently) and implementation dynamics



**Fig. 17.2** Examples of NBS currently in use in Poland, divided by their time of origin and implementation dynamics (Source: The author's own work)

(whether they are increasingly accepted and used or the opposite). To present the broader context of NBS in Poland, in the following subsections we analyse two extreme cases from Fig. 17.2: an example of a new solution which is on the rise (green roofs) and an example of an old solution which is declining in spite of attempts to restore its importance (ecological corridors). The former example provides an overview on a national level, while the latter concerns an individual city (and a specific concept that is meant to promote ecological corridors in that city). Addressing both examples allows us to see similar mechanisms operating at different scales.

### 17.3.1 Case Study 1: The Partial Success of Green Roofs

Green roofs provide a broad range of benefits in urban areas which suffer from a significant loss of biologically active surface (Van Mechelen et al. 2015). Besides aesthetic and recreational aspects, they positively influence air quality (removing particles and other pollutants, absorbing CO<sub>2</sub> and producing oxygen), thermal balance (additional insulation, less energy for heating and/or air-conditioning, reducing the urban heat island effect), water balance and flood protection (stormwater retention and evapotranspiration) and biodiversity (connections between urban green areas, especially for birds and insects). They are also more durable and long-lasting than traditional roofs (Bozorg Chenani et al. 2015), also in the case of extreme meteorological events (strong winds, heavy rains, hails, etc.). They are also considered an important tool of urban climate change adaptation (Brenneisen and Gedge 2012).

Even though there are no official statistics, it is visible that green roofs are increasingly popular in Polish cities. Warsaw is the leader in the construction of green roofs (Kania et al. 2013), but they have been installed also in other cities (Energie Cités 2014). Interestingly, there are relatively old examples of green roofs in Polish cities, created in the 1990s, before the idea became widely discussed, e.g. on car parks. In 1999, one of the most inspiring and spectacular examples was created on the Warsaw University Library (Kowalczyk 2011). Other examples followed, such as the Copernicus Science Centre in Warsaw, the National Museum in Krakow, the International Conference Centre in Katowice and shopping malls in different cities. In the case of housing, green roofs are installed very rarely, and if they occur, it is rather on supplementary objects (e.g. garages) or terraces (Kania et al. 2013). Paradoxically, information on green roofs implemented in Poland is rather hard to find outside of trade press. They are still not seen as something that could be used for promotional purposes. Indeed, in the case of housing developers, greening of roofs and other horizontal surfaces is caused by the local regulations preserving the biologically active area, rather than due to the pressure of customers and their awareness of the benefits of green roofs.

The relatively successful diffusion of green roof innovation in Poland is related to the role played by the scientists and NGOs. Polish Green Roof Association (Polskie Stowarzyszenie Dachy Zielone), the partnership of scientists and NGOs, is particularly active and effective in this regard. The Association's main goal is to develop and provide knowledge on the benefits provided by green roofs and the technical guidelines on their design (Kania et al. 2013), as well as collect and promote good examples from Poland and abroad (Energie Cités 2014). A similar role is played by the on line journal *Dachy Zielone* (Green Roofs).

The important force in the dynamics of this innovation's diffusion has been the inspiration and influence of good examples from abroad. However, recently several other supporting mechanisms have been introduced in Poland, for instance, some cities introduced stormwater fees and other restrictions on its release to sewers or surface waters. Furthermore, there is a possibility to use participatory budgets within which citizens decide how to allocate part of a municipal budget to finance pilot installations of NBS, such as green roofs and walls, but also rain gardens and pocket wetlands.

The importance and activities of the actors, influencing the dynamics of green roofs diffusion in Poland, are presented in Table 17.2. The lack of strong and clearly defined innovator is characteristic for most NBS (including both cases analysed in this chapter). Another characteristic phenomenon is the small current activity of controllers, caused probably by the still low implementation rate of this innovation.

Green roofs illustrate an innovation, which is currently in the key turning point in Poland. On the one hand, it is not anymore the avant-garde, the odd novelty, associated with concerns about its durability and safety. On the other hand, it has not reached the status of a widely used and accepted technology, yet, that would be predictable and routinely designed and applied by the representatives of the mainstream construction industry. It is possible that it will pass through the critical phase

**Table 17.2** Amoeba roles played by the different stakeholders in the case of green roofs in Poland

Amoeba role	Actor in the case study	Role played in the case study
Innovator	–	It is impossible to define an innovator in this case study. Green roofs are an innovation of fuzzy and unknown origin. However, examples from abroad seem to play the most important role in their diffusion and promotion in Poland
Change agents	NGOs (e.g. Polish Green Roof Association, Energie Cités, Sendzimir Foundation), universities (e.g. Wroclaw University of Environmental and Life Sciences), pioneering investors, designers and architects (e.g. Marek Budzynski)	Development and popularisation of green roofs, scientific discourse, advertising good examples, empowering others, organising conferences and workshops Spectacular investments
Transformers	Selected departments within city offices Mainstream media Big, significant developers and investors, installing green roofs European Union	Mechanisms encouraging investors to install green roofs (e.g. financial and legislation solutions, stormwater management tools) Participation in scientific and pilot projects on NBS (e.g. city offices of Radom, Krakow) Articles and other forms popularising green roofs among construction companies and investors (e.g. <i>Murator</i> – the biggest Polish journal on construction of individual houses) Financing the scientific and pilot projects Installing green roofs within municipal investments
Controllers	Ministries Top city authorities responsible for construction regulation Governmental institutions	Institutions capable of introducing regulations, which could enforce green roof installation on a massive scale (both locally and nationally). They could also contribute to the popularisation and credibility of green roofs by installing them on governmental and public buildings. Currently, there are only a few activities of the representatives of this group
Mainstreamers	Private investors Architects and designers Construction companies and developers Residents City officers (spatial planning, local development, municipal investments, etc.)	All individuals and organisations responsible for the design of new buildings, deciding about their technical aspects, both in a scale of individual private buildings, as well as bigger commercial investments, and municipal and public ones, up to the scale of a whole city
Laggards	Construction companies and developers, using traditional roof technologies	Companies specialised in traditional technologies, often not prepared for the transition

(continued)



**Table 17.2** (continued)

Amoeba role	Actor in the case study	Role played in the case study
Reactionaries	Conservative architects and designers Traditional roofing industry Conservative private investors, using traditional roofing technology Departments of city halls and municipal institutions	Technical inertia, technical fears and doubts (safety, leakage, higher costs), general fear of novelty and – characteristic for Poles – very conservative approach to building technologies in the construction of houses (especially single-family ones) Attachment of urban policy makers to the technical guidelines and investment, developed through decades (analogous mechanisms as above) These fears are supported by the representatives of traditional – construction companies, which perceive green roof as a threat to their dominant market position These mechanisms are reinforced by the lack of reliable statistics and scientific research, and clear regulations and design guidelines

Source: The author's own work

For a general description of stakeholder roles, see Table 17.1

(‘rebound’ point, after which the acceptance rate is increasing rapidly) and will be accepted by the mainstreamers as a technology widely used to cover roofs in Poland. However, it is difficult to determine when this may occur. Despite the fact that the area of green roofs installed every year in Poland has a growing tendency, the growth rate is still significantly lower than in the leading countries (e.g. Germany). Thus, there is a huge potential to benefit from international cooperation (e.g. good practice, technical know-how, financial and exploitation results), as well as EU support. However, there is also necessity to initiate the national and local actions that could contribute to a more efficient and faster diffusion of green roofs in Poland.

The innovation's diffusion theory points out the particular importance of collaboration between institutions working for this innovation, especially among change agents, and between change agents and transformers (c.f. AtKisson 2009). This is also confirmed by the analysed case study, which highlights the crucial collaboration between NGOs, universities and green roofers (change agents). Such collaboration can lead to practical and in-depth research and publications, as well as reliable statistics concerning green roofs installed in Poland. This in turn could create an opportunity to improve cooperation between change agents and the media (transformers), and widely popularise research results and statistics, as well as design guidelines and/or catalogues of good practices. Conversely, collaboration between change agents and municipal institutions (other transformers) could result in creating the local (municipal) programmes for financing and promoting green roofs, as well as training courses for designers and contractors (improving their technical capacity, competitiveness and business opportunities).

### 17.3.2 Case Study 2: *The Failure of Ecological Corridors*

Ecological corridors (plus belts and patches) in cities represent the key structure of urban ecosystems and are now often associated with the concept of urban green and blue infrastructure. As indicated earlier, they were implemented already in the socialist period and have been under pressure from urban growth since the fall of socialism. Similar patterns could have been seen in all Polish cities, but in some cities urban sprawl and pressure on green spaces within urban areas have been especially acute, e.g. the largest cities of Warsaw (Gutry-Korycka 2005), Krakow (Böhm 2007), Lodz (Kronenberg et al. 2017) and Poznan (Kotus 2006). In all of these cities, some stakeholders promoted the ideas of green belts and wedges, often combined with the rehabilitation of some areas that had already been covered by construction, but with little success. The concept of the Blue-Green Network (BGN) put forward in Lodz provides an illustration of such an attempt to consciously use NBS, including through ecosystem restoration, ecohydrology and ecological engineering (Wagner et al. 2013).

The concept of the BGN has been developed as a solution to multiple problems of Lodz, such as stormwater runoff, local flooding and droughts, heat waves, poor air quality and increased prevalence of allergy and asthma, low levels of resilience of urban ecosystems and perceived low quality of public spaces. The BGN encompasses a network of ecological corridors connecting the centre with large green belts surrounding the city. The corridors consist of both existing green spaces (including some that need to be rehabilitated) and the newly constructed ones (including dry reservoirs to increase stormwater retention and infiltration and sedimentation of pollutants, etc.). Ecologically restored (or at least rehabilitated) river valleys are meant to serve as the most important connectors within the BGN.

The concept of the BGN has been built on previous planning documents and scientific analyses, through a participatory process carried out within the EU FP7 SWITCH project (Managing Water for the City of the Future). The initiator of the project, the European Regional Centre for Ecohydrology (ERCE), under the auspices of UNESCO established a Learning Alliance (LA) to promote stakeholder engagement in 2006. The LA was joined by a broad array of stakeholders, from local government institutions, through local media, to schools and NGOs. The roles of the different actors – translated into the roles differentiated in Amoeba – are presented in Table 17.3.

Even though the concept of the BGN has been around for 10 years, it is far from becoming a reality, and in practice only few demonstration projects have been implemented to test potential solutions and to promote the concept. The BGN concept has been incorporated into various strategic and planning documents of the city; it is sometimes discussed as one of the key aspects of future development of Lodz, but still other priorities and interests are favoured over the use of NBS. In particular, like in other Polish cities, the preservation of ecological corridors in Lodz is challenged by poor spatial planning and by numerous other institutional failures that inhibit urban greening in general (Kronenberg 2015). Less than one third of the country's area is covered with local spatial management plans that stipulate the allowed land use patterns (Kowalewski et al. 2013). In the remaining area, decisions

regarding land use (construction in particular) are made ad hoc, upon an investor's request, favouring private benefits over public interests.

From the point of view of innovation diffusion which can be captured with Amoeba, the role of the LA has been particularly important in promoting the BGN concept in Lodz (Wagner et al. 2013). The LA has served as a forum where the innovation could be promoted and where it could have been caught on by other stakeholders. The diverse group of LA participants made it possible to exchange

**Table 17.3** Amoeba roles played by the different stakeholders in the case of the Blue-Green Network in Lodz

Amoeba role	Actor in the case study	Role played in the case study
Innovator	–	The BGN is not an innovation per se; rather it is a repackaged set of previous ideas, planning documents and analyses in a form that is meant to sell better. Hence, there is no innovator in this system
Change agents	European Regional Centre for Ecohydrology (ERCE) under the auspices of UNESCO Department of Public Utilities (City of Lodz Office) Sendzimir Foundation Other NGOs promoting the BGN concept	ERCE adapted previous ideas regarding ecological corridors, green belts and wedges and urban ecosystem restoration into the BGN concept. ERCE promoted it through its contacts with other stakeholders and implementation of small-scale demonstration projects. For the purposes of promoting the BGN locally, ERCE presents itself as an innovator, which is one of the strategies often adopted by change agents to ensure a stronger outreach for the ideas they are promoting. Other change agents promoted the concept further, through discussions, publications (e.g. Bergier et al. 2014) and lobbying
Transformers	Municipal Planning Office Forward-looking urbanists and researchers City Strategy Office (City of Lodz Office) Researchers (biology, urban planning) Inhabitants concerned with nature conservation Other NGOs and individuals Few investors	Transformers include early adopters who have been keen to translate the concept into practical strategic documents. Examples include featuring the BGN in the Integrated Development Strategy for Lodz 2020+ (City of Lodz Office 2012) and in the city's masterplan (City of Lodz Office 2010), and the establishment of a network of small protected areas dispersed throughout the city (Ratajczyk et al. 2010). Even individuals act as transformers when they protest against the degradation of urban nature and call for its conservation and rehabilitation. Finally, there have been very few investors who actively restored green spaces within and even outside of their investment projects, contributing to the BGN
Controllers	Ministries President of the city	Those in power to ensure that the concept is implemented in practice and that there are legal instruments that require that the creation of the BGN take priority over other issues (this is a potential role only because so far very little has happened)

(continued)

**Table 17.3** (continued)

Amoeba role	Actor in the case study	Role played in the case study
Mainstreamers	<p>Lodz City Office Department for Urban Greenery</p> <p>Lodz City Office Department for Environmental Protection and Agriculture</p> <p>Researchers other than those who act as transformers</p> <p>Municipal companies responsible for the provision of basic water-related services</p>	<p>Private and public investors and the relevant departments within the local government that are responsible for the creation and maintenance of green spaces. So far, the authorities responsible for urban green spaces and the environment have had limited opportunities to prevent further degradation of urban green and blue spaces. Municipal companies responsible for sewage systems see their interest in reducing the flow of stormwater into the sewage system, but their activities are not entirely consistent (although they formally endorse the BGN as a way to manage stormwater, they keep investing in large-scale traditional stormwater infrastructure)</p>
Laggards	<p>Investors</p> <p>Public authorities responsible for land management</p> <p>Local politicians and council members</p> <p>Contractors responsible for green space and urban infrastructure maintenance</p>	<p>Most investors are reluctant to protect green spaces on their land and especially to give up private benefits for the sake of public benefits. With no specific regulations that would support the maintenance and creation of ecological corridors, public authorities are unable to prevent further construction on agricultural and forest land and further soil sealing. The authorities keep selling out municipal land to earn profit for the city and fail to buy out private land for conservation purposes. All of the above is reinforced by the inertia of public authorities – it is always easier to maintain the status quo, rather than to prepare for change. Also, laggards include those who are supposed to manage urban green spaces and urban infrastructure but fail to do so in an environmentally friendly way</p>
Reactionaries	<p>Land owners and investors</p> <p>Local government appeal board</p>	<p>Many land owners and investors openly oppose the BGN because they fear that it would reduce the value of their land (e.g. by restricting construction opportunities). They actively resist the implementation of the transformers' prescriptions and general plans. They apply for construction permits on their agricultural and forest land. They seek legal loopholes and benefit from the fact that the legal system in Poland downplays the significance of urban green spaces (Kronenberg 2015). Their right to derive private benefits from their land (as opposed to the delivery of public benefits) is further reinforced by the local government appeal boards to whom private investors can appeal if they are not satisfied with decisions issued by other public institutions. This links to further problems with the overarching idea of freedom, including freedom to build and especially freedom to build on one's land. Reactionaries try to ridicule those who protect nature as outdated, who do not understand the idea of a modern city. They try to discredit environmental NGOs and other groups defending urban nature</p>

Source: The author's own work

For a general description of stakeholder roles, see Table 17.1

and further disseminate knowledge and provide access to the latest examples from abroad. However, the LA required a significant coordination effort, and it was not necessarily composed of those in power to make the relevant decisions. Those in power and interested in promoting change, i.e. transformers, have not been effective in making the change happen. The documents that they prepared (such as the masterplan), which could have translated the BGN into practice, were not internally consistent, and the transformers could not make sure that the prescriptions regarding the BGN were actually implemented. To a large extent, this has been related to institutional failures, such as the fact that the legal system in Poland limits the possibilities to protect urban green spaces. To promote the BGN concept further, and to implement similar concepts in other cities, the controllers would have to endorse this innovation and change the rules of the game to favour its implementation (the first sign of positive change has been the National Urban Policy which explicitly linked to these issues (MiR 2015)).

## 17.4 Discussion and Conclusions

The concept of NBS fits well into the neoliberal world where the existence of anything needs to be justified by its ability to solve some problem. Thus, it should sell easily in Poland and other post-socialist and post-transition countries, where neoliberal (economic) ideas have caught on. In fact, the new socio-economic system introduced in Poland as a result of transformation from a socialist country should in theory create a window of opportunity for new solutions. However, in practice NBS are difficult to accept, because modern solutions are usually associated with ‘hard’ infrastructure, rather than greenery. Furthermore, the ideas of a green city clash with those of a modernist city made of concrete, glass and steel (which are still seen by many as an ideal that Polish cities should finally strive to achieve). As a result, many opportunities to preserve green spaces that are essential from the point of view of ecological corridors are missed, along with opportunities to introduce new components of green and blue infrastructure that would fill the gaps in such corridors. Moreover, NBS have already been known and used for a long time; they are not necessarily seen as an innovation; thus they are not attractive for the mainstreamers. Still, perhaps the NBS framework can help to see nature from a new perspective and convince mainstreamers that we do need nature because it addresses many crucial needs of urban inhabitants and should be seen as an innovation in itself.

Innovators and – in our cases – especially change agents and transformers (i.e. those who promote innovations) are usually relatively less powerful than other stakeholders, especially those who represent well-established solutions. In our case studies, NGOs and research institutes, promoting the use of NBS in Poland, are on the margin of decision-making structures. Transformers who introduce new concepts to the broader public are under pressure from conflicting groups of interests. Meanwhile, those who stand behind well-established solutions often represent these structures. Hence those who promote innovations and their ideas clash against omnipotent structures of laggards and reactionaries and against the barrier of con-

formism of most mainstreamers. To be more effective in promoting their innovations, they need to collaborate with other stakeholders. In particular, based on the theoretical foundations of Amoeba (AtKisson 2009), change agents need to work with transformers, and the different change agents need to collaborate closely with other change agents. Meanwhile, collaboration in the area of green space management in Polish cities is poor, and few stakeholders are involved in this area (Kronenberg et al. 2016). NGOs, who are particularly strongly involved and are also marginalised, and they may not be able to promote innovations, at least not alone. Indeed, reactionaries often tend to marginalise change agents (discrediting change agents is one of their most effective strategies). Therefore, change agents should work with those who show the potential to accept their ideas and to promote them further, rather than waste their time on talking to reactionaries.

Similar to many other types of sustainable development opportunities, the main driver of potential increased interest in NBS in Poland can be associated with an outside pressure, especially coming from the EU (Kronenberg and Bergier 2012). To some extent, EU institutions act as ultimate controllers who set the general framework for the national social and institutional structures. Their pressure could be the most effective had it been connected with conditional funding (Poland is the largest beneficiary of EU structural funds). Changing the legal framework in Poland to favour NBS could also result from continued pressure from those who have been promoting NBS so far, especially if transformers highlight inconsistencies between the current legal framework and the one necessary for the implementation of NBS.

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