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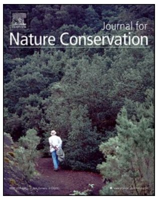

Biodiversity offsetting as a form of depoliticised nature: Social aspects of a pilot project in Lahti, Finland

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ABSTRACT

We examine the public perceptions of an urban biodiversity offsetting pilot project and the implications of such a project for conflicts in urban planning. The City of Lahti was the first in Finland to pilot biodiversity offsetting in its urban planning in 2021. This pilot project demonstrates the contradictions of depoliticised nature, which the urban context makes visible. We draw on interviews with city planners and other city officials, residents and stakeholders, workshops, and documents tracing the pilot project. The case study shows how biodiversity offsetting risks rendering urban planning and its inherent conflicts over preserving greenspaces and enabling development to a set of technical measurements and valuation, while "the social" in urban planning becomes secondary. The theoretical framework of depoliticisation highlights the tensions between the biodiversity offsetting scheme and the participatory planning processes. The former is presented as depoliticised and incontestable, while the latter are overrun by a technocratic measuring of ecological values. We conclude that the contradictions of depoliticised nature are built into the core of biodiversity offsetting and consider ways to improve the social fairness of offsetting in urban contexts.

1. Introduction

Just as biodiversity loss has gained increased political momentum on the political agendas of governments throughout the last decade (Whitehorn et al., 2019, Corbera et al., 2021), so has the concept and practice of biodiversity offsetting (Droste et al., 2022). Together with the global trend of urbanisation, a growing body of literature has begun exploring biodiversity and its loss in urban contexts (e.g., Haaland and van Den Bosch, 2015; Knapp et al., 2021). In this research, we investigate the first urban biodiversity offsetting pilot project in Finland, in the city of Lahti (Varumo, et al. 2023).

At the core of biodiversity offsetting (BO) is the idea that biodiversity loss in one place can be replaced by increasing or improving biodiversity in another place (BBOP, 2012). BO seeks to curb biodiversity loss by providing solutions that aim for "No Net Loss": the net amount of biodiversity remains the same even if the location of biodiversity changes. BO is often viewed as the last resort of the mitigation hierarchy meaning that options for avoiding biodiversity loss should be explored first, followed by minimising loss, and only as a final step should biodiversity loss be offset (e.g., Bull et al., 2013). However, in practice, the use of the mitigation hierarchy is often poorly documented and most emphasis is placed on offsetting (Vammen Larsen et al., 2018; Barbé and Frascaria-Lacoste, 2021).

We draw on urban political ecology and post-political and depoliticisation literatures to frame the concept and practice of BO as a political endeavour which aims to influence the way nature and its socio-material processes are perceived, managed, and (re)produced. We define depoliticisation as a removal of potential for political contingency, deliberation, and collective agency (Hay, 2007) and as a form of technical and managerial administration (Swyngedouw, 2000, 2011, 2014). In doing so, we demonstrate through our case study how an urban pilot functioned as the latest example of technocratic managerialism over urban nature,[1] reducing nature to numbers and bypassing participatory land-use planning.

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[1] The term "urban nature" bears multiple meanings (see, for example, Hoyle 2020). As the context of our study is Finland, the cities of which are relatively small and sparsely built in global comparison, we define urban nature as the remnant, often forested spaces both within and on the fringes of cities, excluding heavily managed urban parks.

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Our empirical analysis builds on our participants' perceptions of the planning process and the BO pilot that was added onto that process as an afterthought. Our findings contribute to a conversation prompted by Apostolopoulou (2020) as we examine the effects of BO by situating our case study as a concrete, real-life example which makes visible depoliticisation of nature. In our analysis, we explore the key lessons learned regarding the city planning process and the integration of BO and consider ways to improve the implementation of BO in urban environments.

2. Social and ecological impacts of biodiversity offsetting

The premise of BO is that development, such as expansion of urban areas, can continue uninterrupted as offsetting ensures that the total sum of ecological values remains the same. BO aims to reconcile physical expansion (as a proxy for economic growth) with nature conservation by the appearance of win–win solutions. It supports the belief that nature can be re-created while emphasising that There Is No Alternative (TINA) to urban expansion (Apostolopoulou and Adams, 2019; Apostolopoulou, 2020).

This approach to nature and conservation fits into a broader frame of depoliticising nature, in which decisions regarding nature lack political contingency (Hay, 2007; Swyngedouw, 2014). BO relies on expert-driven metrics and pre-determined numeric valuations of nature, which remove contingency and reduce the space for genuine deliberation and collective agency, since the parameters of what is possible are set by the measurements. Consequently, our understanding of depoliticised nature refers to a general approach of reducing nature to exchangeable values via technical and 'neutral' means, typically by natural science professionals using complex modelling and calculation schemes. This reductive approach to nature removes the place-specific uniqueness of nature and its multiple meanings (Apostolopoulou et al., 2018; Spash, 2015).

While numerical valuation of ecological values tends to account for rarity, vulnerability, and wilderness by assigning higher scores to such nature (BBOP, 2012), less unique or 'common' landscapes receive lower valuations making them a potential target for development regardless of their social significance (Apostolopoulou et al., 2018). The distinction between 'common' and 'unique' nature drives an artificial division between human and non-human natures by separating social history from physical landscapes (Katz, 1998). This is particularly problematic in urban contexts, where greenspaces can be parks with little biodiversity or fragmented patches of high biodiversity but with a diversity of social functions, meanings, and values for residents.

So far, the integration of social and cultural place-based values and the associated impacts into BO has not been seamless. These highly contextual impacts can occur both at the development and offsetting site ranging from issues related to the offsetting procedures to wider societal consequences (Tupala et al., 2022). The social impacts concern access to nature and the provision of various cultural values and ecosystem services, which have implications for livelihoods, health, and the wellbeing of local communities (Bidaud et al., 2017; Seagle, 2012). In the offsetting area, the opportunities for residents to benefit from nature can become more limited, for instance, due to the establishment of strictly protected areas (Bidaud et al., 2017). Despite the recommendation of the Business and Biodiversity Offsets Program (BBOP, 2012) and good practice principles to ensure No Net Loss for people (Bull et al., 2018), the perspectives of local communities and the compensation of their socio-cultural losses are rarely considered in offsetting planning processes (Tupala et al., 2022).

In the European context, the core social issues related to BO might focus less on the location of the offsetting area and more on the development site and the social values lost there (Corbera et al., 2021). These values would be at risk from development even without any offsetting of ecological values. However, the inclusion of BO in urban planning can enable development projects which would not otherwise gain planning permission (Taherzadeh and Howley, 2018; Apostolopoulou, 2020). For instance, in the UK, offsetting has been leveraged to facilitate the zoning and permitting process of new construction developments (Apostolopoulou and Adams, 2019).

The relocation of ecological values enabled by BO is the key problem in offsetting in urban planning (Kalliolevo et al., 2021; Ives and Bekessy, 2015; Apostolopoulou and Adams, 2019). In urban areas where green spaces are scarce, the health, wellbeing, and community cohesion benefits enabled by greenspaces can be unequally distributed (Mears et al., 2019).[2] BO can aggravate this situation. For example, in Perth, Australia, BO has moved nature further from the city to less densely populated areas, which may mean net wellbeing losses. However, offsets can also improve public accessibility to land by converting land ownership from private to public tenure (Kalliolevo et al., 2021).

Offsetting creates a placeless and reproducible understanding of biodiversity (Apostolopoulou et al., 2018; Apostolopoulou 2020b). This is problematic because the ecological valuation simplifies ecological relationships and easily results in different kind of nature replacing the lost nature. Furthermore, the placeless understanding contrasts with the place-specific and even irreproducible values attached to nature by locals (Moreno-Mateos et al., 2015; Scholte et al., 2016; Griffiths et al., 2019). The willingness to accept offsetting is particularly difficult for residents with a long history in a region since their cultural identity may be threatened by additional construction. BO cannot replace such deeply rooted cultural values (Scholte et al., 2016).

In England, poorly conducted stakeholder participation has been identified as a key barrier to achieving meaningful offsetting (Taherzadeh and Howley, 2018; Apostolopoulou and Adams, 2019; Apostolopoulou, 2020). In the case of Whitehouse Farm in North Tyneside, the developers refused to respond to residents' concerns and instead questioned the validity of their claims (Apostolopoulou, 2020). The evaluation of ecological values and related decision-making lacked transparency from the residents' perspective, as the mechanisms used for calculating the offsetting were complicated and the involvement of residents was inadequate. The tendency to consider BO as a matter for experts can obscure the various interests in land-use planning (Apostolopoulou, 2020).

Therefore, to politicise BO, there is a need to strengthen the role of the affected community in defining the conditions of BO but also a need to improve the potential to compensate for the social impacts caused by offsetting and development. Taherzadeh and Howley (2018) warn of the risks such endeavours could bring to preventing biodiversity loss. Creating ecological metrics for valuation is a complex and controversial task, and integrating social values into the equation would likely create crude trade-offs that are hard to legitimise. Yet, in contrast to these risks, they suggest some formal requirements, such as access to nature, to compensate community losses as part of an offsetting metric (Taherzadeh and Howley, 2018).

Taherzadeh and Howley's (2018) recommendation can be seen as emblematic of BO. Offsetting contains a balance between economic interests and ecological values, with the implicit assumption that ecological values are more easily relocated than economic interest. While it is possible that high ecological values become too expensive to replace, the dominance of economic perceptions affect the systems for the accounting of biodiversity (Apostolopoulou et al., 2018; Knight-Lenihan, 2020). The equal consideration of the interests of local communities and the interests of developers is seen as too complex and subjective, while the numeric metrics of biodiversity are inherently reductive. There are multiple conflicting interests in land-use planning, and the perceptions of new developments within local communities can be contradictory. Inevitably, this means that some perceptions are considered more important than others (Takacs, 2020). Regardless of the procedures used in the design and implementation of the offsets, the approach in BO is reductionist to the ecological and social values of nature. Hence, a key conundrum is whether it is possible to offset biodiversity while maintaining social and ecological connections.

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[2] However, it has been difficult to make generalisations about the socioeconomic equity of greenspace distribution due to methodological plurality and inconsistencies (Mears and Brindley, 2019).

3. Materials and methods

The piloting of BO in Lahti has its origins in an EKOTEKO research project, which was a collaborative effort between the University of Helsinki and Finnish Environment Institute. The EKOTEKO project sought to develop metrics for measuring ecological values to pilot BO in urban contexts using Lahti as the piloting site (Varumo et al. 2023). Our investigation–to better understand the social aspects and consequences of implementing BO in urban planning in the EKOTEKO pilot– was conducted after the EKOTEKO project was completed.

3.1. Case context: The development and offsetting of the Kytölä residential area in Lahti, Finland

Lahti, situated in southern Finland, is a municipality of 120 000 residents and the regional centre of Päijät-Häme for 200 000 people. Although small by international standards, the Lahti region is the sixth largest urban area in Finland, with significant greenspace and inland waters (Lahti, 2013). The majority of Lahti's greenspace consists of forests designated primarily for recreational purposes. This does not, however, exclude them from forestry activities, and only 2 % of the city's area is protected. Yet Lahti has striven to be a leader in promoting environmental sustainability, and the City[3] has set an ambitious aim to become carbon–neutral by 2025. Meanwhile, Lahti has been the only centre for population growth in the overall Päijät-Häme region during the 2010 s (Päijät-Hämeen liitto, 2020), which has put pressure on housing development.

In 2012, in compliance with the City's strategic aim of rapid urban development, the City initiated the drafting of a local detailed plan in Kytölä, which was then a small, semi-rural residential area approximately 4 km to the northeast of Lahti's city centre (Fig. 1). The planning area (~90 ha) consisted mainly of forest and farmland, with only 15 residents in total. Some of the forests were over 100 years old, and several sections with high biodiversity values had been identified. Recreational opportunities were ample, and the forests' crisscrossing footpaths attracted day hikers, berry pickers, and other outdoor enthusiasts from neighbouring areas.

The purpose of the local detailed plan was to assign small- to medium-density housing to nearly 800 new residents in Kytölä–a considerable increase to the original 15 residents. The planning initiation was followed by a residents' evening, giving them an opportunity to voice their opinion on the planning. Those who owned real estate in or adjacent to the planning area were also contacted by mail and provided with a first draft of the plan. Although many residents objected to the development, the final plan was approved in 2014, allocating approximately 18 ha of plot area for housing–the majority of which was situated in forested areas. The residents first appealed against the planning decision in a regional administrative court and later in the supreme administrative court. Their objections were overruled, and the plan came into force in 2016. By the end of 2021, the municipal infrastructure had been built and the first plots were allocated in the following spring.

The BO pilot was largely managed and run by the city officials (Varumo et al., 2023). Research partners in the project evaluated and calculated the ecological values of the developed area. A suitable offset area was sought based on these calculations. Due to the time limits imposed by the project, the search focused on City-owned land. Consequently, a 20-ha patch of City-owned forest was chosen as the offset and to be considered for protection. The offset was located near the district of Nastola, 9 km southeast from the development site (Fig. 1). The offsetting site had quite high levels of biodiversity, and while the area was technically classified as a forestry site, no major forestry activities had been conducted there in recent decades. Notably, neither social impacts nor the perspectives of residents were considered in the offsetting calculations and planning. The offset pilot was purely an ecological exercise, since the land use plan for the development of the area had already been accepted by the City and the area was already under construction. The City announced the offsetting pilot to the public in November 2021, at a point when it had already been completed (see Fig. 2).

3.2. Data collection

Our data consisted of various qualitative sources: semi-structured interviews, workshops with key actors, public texts, land use planning documents, and the sourcing of formal community objection letters (Table 1).

First, we compiled formal land use planning documents including residents' official letters (objections) to city planners regarding the drafting of the local detailed plan in Kytölä. The letters (n = 15) were sent in 2012–2013 and offered information on the kind of values locals assigned to Kytölä's greenspaces prior to construction and the kind of damage locals felt was being inflicted by the plan. These were supplemented by interviewing those residents who had sent letters and by using the snowball sampling method to find others who either had a connection to the development or offset site. Furthermore, we contacted local groups and organisations with a possible interest in the areas, such as sports clubs and nearby schools. With these actors, we conducted semi-structured interviews (n = 9, three of which were group interviews) from December 2021 to February 2022. These interviews helped us further understand the case and assess how the offsetting scheme was perceived by locals and other greenspace users.

We also interviewed various Lahti city officials and EKOTEKO project researchers. These semi-structured interviews (n = 10) helped us gain a more detailed understanding of the offsetting project and city planning in Lahti. We also discussed how residents' views and the social values of greenspaces are considered in land use planning.

For more generalised insights, we arranged two workshops (advertised to the public via social media and electronic mailing lists). Workshop participants included Lahti residents, city officials, and members of our research team. The first workshop (n = 7), held in November 2021, focused on the values and meanings that citizens assign to greenspaces, how these values are related, and to what extent they are commensurable. The second workshop (n = 10), held in February 2022, invited residents to deliberate on what kind of practices are needed to ensure a fair and just BO process in land use planning.

Finally, we complemented our data by collecting online material (n = 7) published by local newspapers that dealt with the offsetting of Kytölä's biodiversity values after the pilot scheme and its completion had been publicised (from November 2021 and December 2021). These opinion pieces and news articles provided us with a window into public sentiments in the Lahti region after the City's disclosure of the pilot scheme.

The data we gathered allowed us to construct a picture "after the fact", rather than study the offset pilot from the very start. Inevitably, this timeframe has affected data quality (e.g., some events took place many years ago, so participants' memories, views, and opinions may have changed over the years) and the kind of data that exist.

3.3. Analysis

Our analysis builds on qualitative content analysis (Hsieh &

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[3] In this article,'City' (with a capital C) refers to municipal administration of Lahti, while other mentions of'city' with a lower case refer to the city as a whole.

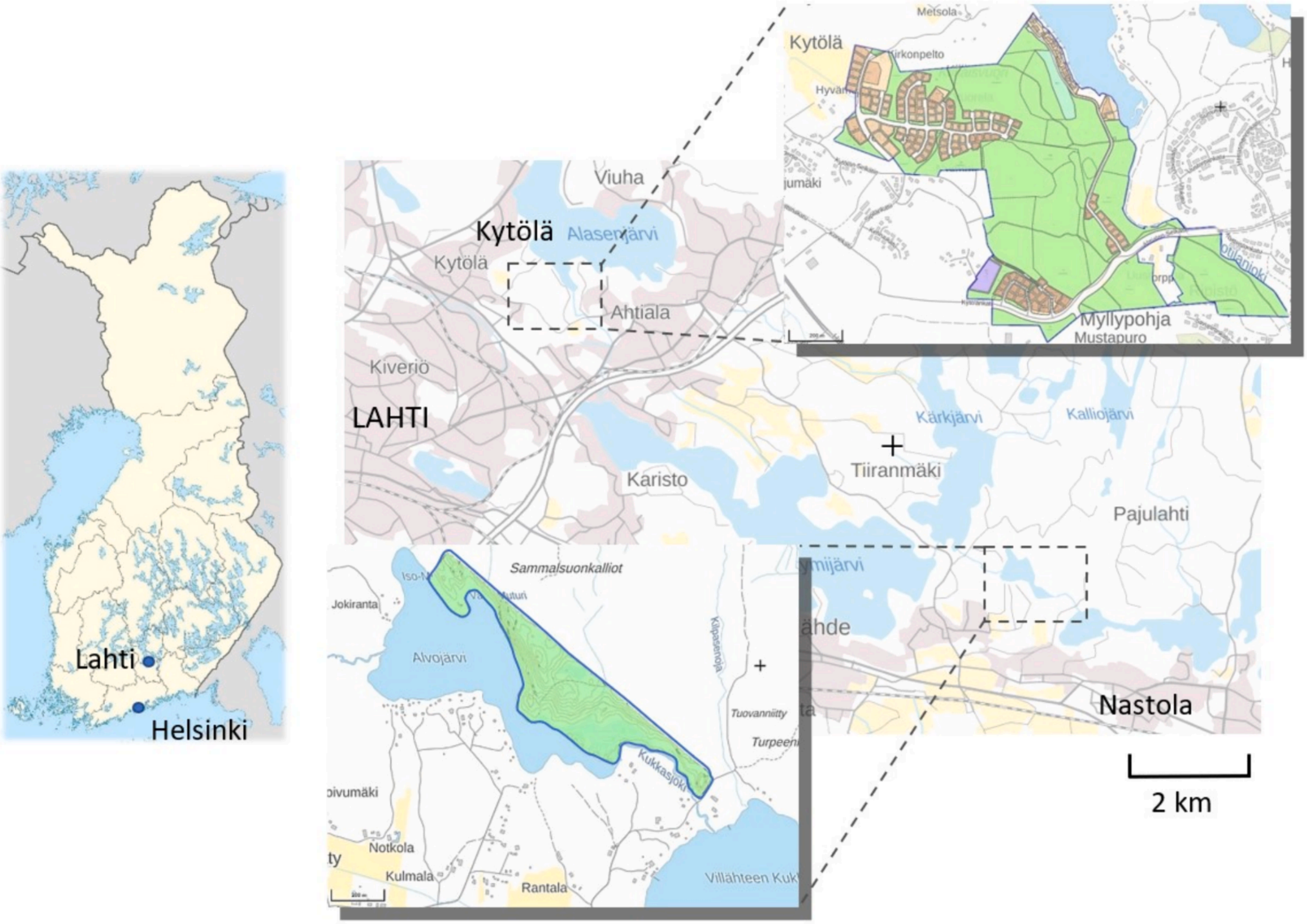
Lahti
Helsinki
Kytölä
Viuha
Alasenjärvi
Ahtiala
Kiveriö
LAHTI
Karisto
Kärkjärvi
Kalliojärvi
Tiiranmäki
Pajulahti
Nastola
2 km
Myllypohja
Mustapuro
Sammalsuonkalliot
Alvojärvi
Kukkasjoki
Jokiranta
Notkola
Kulmala
Rantala

Fig. 1. The case city of Lahti, with a close-up of the Kytölä plan and the offset site in Nastola.

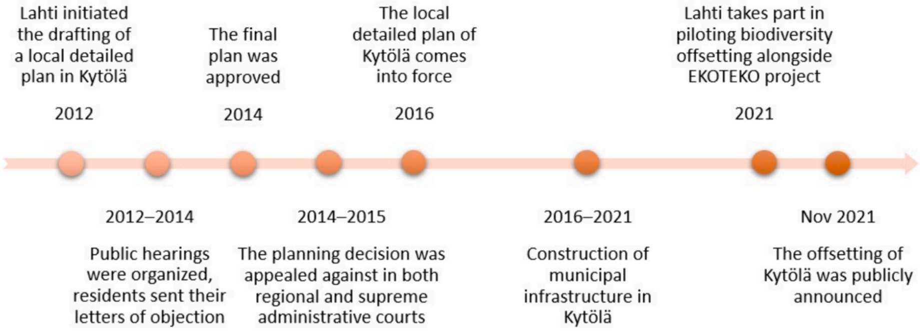
Lahti initiated the drafting of a local detailed plan in Kytölä
2012
The final plan was approved
2014
The local detailed plan of Kytölä comes into force
2016
Lahti takes part in piloting biodiversity offsetting alongside EKOTEKO project
2021
2012–2014
Public hearings were organized, residents sent their letters of objection
2014–2015
The planning decision was appealed against in both regional and supreme administrative courts
2016–2021
Construction of municipal infrastructure in Kytölä
Nov 2021
The offsetting of Kytölä was publicly announced

Fig. 2. Timeline of events of the Kytölä development and the biodiversity offsetting pilot.

Shannon, 2005). All workshop and interview data were transcribed, and all data and documents were then analysed. We used an inductive approach, openly coding the textual data without drawing on any initial theoretical framework. Together, we discussed the coding and the themes identified. We view this iterative process of reading, coding, and deliberating as a form of "blended approach", as discussed by Graebner et al. (2012). In doing so, we were able to find commonalities across different types of data and across the offsetting pilot timeline. The core identified themes focused on the social values attached to the Kytölä development area, perceptions on participation in the planning process and regarding BO.

When conducting the analysis, we had to be mindful of the difficulty in differentiating between urban planning and the offsetting pilot as two separate but overlapping processes. The city officials who directly participated in the pilot were able to distinguish between their usual work and the additional work caused by the pilot. However, residents and other greenspace users only learned about the pilot once it had been completed. Consequently, it has not been entirely possible or meaningful to differentiate between the views of residents on the offsetting pilot and their views on urban planning processes more generally.

4. Results

4.1. Planning and developing Kytölä

The development of Kytölä evoked strong emotions amongst the

Table 1
Full list of interviews, workshops, and textual sources.

	Textual sources
Land use planning documents related to Kytölä development	• Local detailed plan report • Participation and assessment scheme • 15 objection letters
Public texts about the offsetting in Kytölä (n = 7)	• 7 opinion pieces or news articles
	Interviewees and workshop participants
Interviews of Kytölä residents and greenspace users (n = 9*)	• 5 residents • 4 members of an environmental organisation • 2 members of a sports club • 2 teachers from a nearby school • 1 other active citizen
Interviews of city officials and offset project researchers (n = 10)	• 8 planning related city officials 2 project researchers
Workshops (n = 2)	• Workshop 1: • 4 city officials • 3 residents • Workshop 2: • 8 residents • 2 city officials

[*] Six individual interviews and three group interviews with 2, 2, and 4 participants.

residents. Locals were keen to speak about their intimate relationship with the area and to highlight the values they attributed to special places to which they felt a personal connection. The residents viewed these places as part of their local identity and as minor attractions that helped to bind the community together and integrate newcomers. None of the identified special places possessed particular ecological values.

> "Yeah, it is my roots, I have grown up there and in those woods … it strongly represents my roots and it is my home … the sense of your roots … makes [the connection] deeper." [Kytölä resident]
> "… if there are no places to meet others … if everyone just has their own yards and then a long street in between them … it doesn't create such possibilities. In my opinion that spring and those pines would have been obvious village attractions." [Kytölä resident]

The loss of places important for the community seemed hard to digest. In addition, the locals were attentive to the fragmentation of the landscape: the previously broad and uniform forest was cut through by the new housing. Since hardly any space was left between the new plots, access to some parts of the greenspace was compromised.

During the planning process, a cause of concern was how participation was realised. The Kytölä residents felt that they had no genuine opportunities to influence the planning decisions and that the planners were uninterested in their viewpoints. Although formal participatory events were held, the residents felt excluded from the planning process and discerned a lack of respect for their opinions. A similar sense of sham participation was recognised as a general feature of resident meetings:

> "… in [resident meetings] you easily get this feeling, that [the plan] is quite pre-digested and it's like not worth leaving any [comments] because it's so thoroughly designed already. I feel the same, that often people hope that they could get to hear a presentation at an early stage." [resident / workshop participant]

Though the use of participatory methods in city planning is required by law, the requirement has been flexible. Nonetheless, there have been improvements in participation in recent years. Urban planners and city officials have broadly recognised the significance of allowing residents to feel they are being heard and able to influence decisions which affect their local surroundings. The extent to which participatory methods and resident engagement succeed, resulting in an increased acceptance of the plan, partly depends on the individual planner.

The interviewees and workshop participants underscored that participation should start at the very beginning of the planning process when it is still possible to make considerable changes to the plan. Thereafter, there should be a regular exchange of ideas between the locals and the planners. However, this does not mean that the residents assumed that their opinions would always be fully implemented. Instead, they expected respectful conversations and clear explanations of the zoning decisions throughout the planning process.

The city officials were aware of the challenges of improving participation. On the one hand, it is difficult, if not impossible, for a planner to identify all those who are affected by a plan. On the other hand, it is hard for residents to remain alert and keep up to date with planning. Some interviewees said that they were aware of the recent development plans in Lahti, including Kytölä, while others struggled to find the time and effort to obtain relevant information.

> "… you really must be an attentive citizen to notice, you have to follow up some mysterious City webpage to even notice these things … sometimes it feels quite random the way in which [the plan] pans out, like who can participate in it." [Kytölä resident]

4.2. Offsetting Kytölä: Perspectives of city officials and project researchers

City officials and project researchers described the offsetting project as a demanding yet valuable learning process. Although the offsetting calculations were complex, the biggest challenges had to do with the practicalities, such as how to find a suitable offset site.

Since the framing of the project was purely ecological, the social impacts of offsetting were intentionally disregarded. The rationale was that since assessing social impacts is already part of a regular zoning process, and the local detailed plan for Kytölä had been approved, no further assessment was needed. In the interviews, the city officials considered it beneficial to separate ecological and social impacts, though they recognised the need to clarify what BO is–both internally, within their organisation, and in external communications.

> "… the starting point was that [Kytölä] had gone through the zoning process and [the plan] had been approved in the regular zoning process, in which I would hope, and I do believe that these regular rounds [of hearing and opinions] had been carried out, in which the social aspects of development had been considered." [project researcher]

The selection of the offset site required many internal discussions and negotiations over the different and somewhat opposing goals of the City: nature protection, recreational opportunities, and the financial return on land. In this context, the role of the land acquisition officer was central. In interviews with other city officials, it appeared that it was this officer who acted as a gatekeeper, with responsibility for deciding not only what kind of land purchases and acquisitions were (economically) possible but also which were desirable.

> "We do need natural areas and untouched areas, but they are not exactly the first priority of councils and Cities to have such, but an efficient, emission-free, carbon neutral and so on development of the city." [city official]

Over the course of the pilot, plans regarding the choice of the offsetting site had to be changed because of complications and delays related to the acquisition of the original offset site, which was on private land. Consequently, a second site, already owned by the City, was chosen, due to the tight timeline of the project. How the offset site was chosen was a major point of confusion, demonstrating the contextual complexities in urban BO.

> "We were puzzled by the offset site, because where we had a detailed plan for recreational use it turned out to be no good for this offset.…

> A site a hundred kilometres away would have got similar offsetting points [for ecological values], so the location and such made in principle no difference at all … We were left with a lot of questions." [city official]

Despite these complexities, the project succeeded in connecting relevant city officials, spurred discussions within the organisation, and increased internal understanding of the competing goals. With further development, the city officials viewed BO as a potential tool in their future work. So far, there has been no regular or systematic collection of data and information by the City regarding the social impacts and urban planning that affect greenspaces. This offset pilot has highlighted the need for such a systematic approach. However, the city officials did not view that BO will, by default, resolve the social-environmental conflicts inherent in urban planning by making developments acceptable to residents. They pointed to specific ways to increase acceptability, including finding offset sites closer to lost greenspaces and conducting more active restoration measures over a longer timespan while also monitoring and collecting evidence of the benefits of offsetting.

4.3. Public response to the Kytölä offsetting scheme

The City disclosed the offsetting scheme in November 2021. Three clear, recurring criticisms emerged from the public's views: 1) how the BO had been implemented; 2) the lack of public engagement in the planning; and 3) the lack of transparency and clear communication regarding the planning of the development and the offsetting pilot.

Most of the criticism in local newspapers concerned the additionality of ecological values and the permanence of the biodiversity gains. The newspapers argued that the offset site was already rich in ecological values and that there was no real threat of losing these values: they saw no genuine risk of trees being felled. Opinion pieces contended that offsetting is unacceptable if ecological values are not shown to increase and if the permanence of the added ecological values is not guaranteed. Further objection was prompted by the suddenness of the offset decision and the lack of transparency of the process.

Similar issues arose in the interviews with the Kytölä residents. Interviewees underlined that offsetting is too late if planning decisions have already been made and construction on the development site has begun. They also regarded the remoteness of the offset site from the development site as unacceptable. The offsetting decision seemed to provoke more frustration than endorsement. Although formally invited to express their opinions, the residents felt that they had been ignored in the Kytölä planning process. The secrecy surrounding the offsetting pilot only diminished their trust further. Many interviewees constantly reiterated their sense of exclusion during the planning process.

> "You get this feeling that when we gave our opinions you weren't interested at all, and now there is this greenwashing … you had every chance to do something about this earlier, but you didn't want to listen to us, and now you're trying to conciliate us and appear environmentally friendly by offsetting." [Kytölä resident]

The pilot demonstrated the consequences of ill-timed communication of BO, which occurred here only once the offsetting had been completed. In future, consistent, and early communication of BO, occurring in dialogue with residents, is of vital importance, a point that has been acknowledged by the city officials.

Despite the negative public perceptions of the Kytölä pilot, BO was generally viewed as a tool worth developing. Some residents felt that it would be better to offset than to allow the current situation to continue. Still, many argued that it would make more sense to try to avoid biodiversity loss in a development site. Indeed, many interviewees were more comfortable with the notion of mitigation hierarchy and strongly prioritising the avoidance and mitigation of biodiversity loss over offsetting.

> "It would be best if they [ecological values] could have been preserved here … [offsetting] is a good thing too, all activities towards restoring nature are good … but I would hope that before the excavators arrive and before the planning decisions are finalized, we could consider whether something can be conserved here as well." [Kytölä resident]

Throughout the interviews and workshops, all participants noted that full offsetting (understood to encompass all the values greenspaces hold) is unfeasible. Newly protected or restored habitats are not the same as the lost ones–the lost habitats are seen as incommensurable. Nevertheless, the interviewees identified three measures and practices that could mitigate the loss of social values. First, they deemed it important to secure access to greenspaces. Second, they hoped for the greening of the built environment, for example, by planting more trees and flowering shrubs. Finally, the locals would have liked to preserve their community's special places and for the community to decide upon their development. Yet, the most important thing is to foster early and genuine participation to increase the acceptability of offsetting.

> "How could you compensate it? Well, it counts a lot if you take us into account and tell us what is happening and why … to have a sort of dialogue and not like, 'here is the border of your house and this is the City's territory and here we do as we please' [Kytölä resident]

5. Discussion

5.1. Depoliticising nature with biodiversity offsetting

In this study we aimed to demonstrate how biodiversity offsetting can reduce urban planning over greenspaces into technical measuring of ecological values, while the local socio-cultural values and participatory aspects in land-use planning become secondary. Our results show that the residents' values do not fit into the pre-determined framing of BO and are often not quantifiable in a way that could contribute to the discussion. If future debates on urban development and greenspaces are only framed in terms of numerical ecological values as presented in BO, the non-quantifiable rationales of residents will be rendered irrelevant to the technical and managerial City administration. Consequently, the residents will be unable to counter and contest planning decisions based on the values they place on greenspaces as the value of greenspaces has been depoliticised.

Even when taken the intentions of the BO pilot at face-value, the perceived winners of the offset were a) the City and its consequent (economic) growth, b) companies and developers involved in the construction, c) the new residents moving to the newly developed area, and d) biodiversity due to "no net loss". In this case, no gains were perceived for the offset site. Instead, on the losing end were residents, both individually and collectively, the local school, sports association, and other greenspace users. At the offset site, worries over possible restricted access to the site also led to losses rather than gains. This imbalance between the losers and winners and related unequal power relations has also been pointed out by Apostolopoulou (2020b). While in the Lahti case, you could argue that the offsetting did not impact the loss of the greenspace by the residents except potentially at the offset site, it is evident that in order to create legitimate and socially just biodiversity offsetting system, the power imbalances need addressing.

There was internal politics at play within the city planning offices, particularly between the land acquisition, planning, and environmental offices. The internal politics of land acquisition, together with the pressure of a quasi-externally determined timeline, delimited what was possible for this pilot. These constraints placed the city planners in a straitjacket of sorts, in which "there is no alternative" – another, even if different, pre-determined set of parameters within which to operate. This kind of politics was not visible to the public and was perhaps, at least partly, the result of the BO project being a pilot (a source of learning: clarity regarding roles, responsibilities, coordination, etc.). Moreover, bound by the City's strategic objectives of growth, the officials approached the BO as a technical tool for growth instead of a political (and public) project, with little in-built consideration of the residents' social experience of greenspaces and the city. Thus, the technical appearance of the pilot does not imply a lack of politics and contestation, but rather that these occurred away from public view. However, the invisibility of such politics meant that the public was unable to participate in the politics that did take place.

When comparing the Kytölä case with other similar reported cases from the UK (Apostolopoulou, 2020; Apostolopoulou and Adams, 2019) and Australia (Kalliolevo et al., 2021), it is evident that the societal contexts differ. In the UK and Australia, private sector involvement in implementing BO policies has been prevalent. In contrast, in the Lahti case, the core actor was the public sector in the form of the natural sciences research community and city officials, while the absence of private sector involvement is notable. The lack of private sector engagement in our case study is significant because the private sector has played a major role in other countries and contexts in pushing forward BO. Our case illustrates that even if BO is led by a public-sector administration, the dynamics that play out are similar to those in cases with high private-sector involvement. The implication is that even if the BO is led and implemented by the public sector, nature still becomes depoliticised by the process as it is inherent in the idea of reducing nature to ecological values.

5.2. *Key lessons for biodiversity offset planning*

Our results showcase the complex dynamics that played out in the planning and development of Kytölä and the following BO. The grievances experienced by residents prior to the offsetting pilot were typical of urban planning in general, stemming from poor communication and engagement with residents. As the decision to offset was only made after the planning decision, the pilot itself was unrelated to these decisions. The decision to publicise the offsetting pilot only once it had been completed was not well received by the public. Instead, BO brought the grievances related to the planning of Kytölä to the fore. Overall, our results align well with what Sterling et al. (2017) have identified as crucial for successful conservation in general including 1) early engagement and active involvement, 2) attention to locals' perceptions and 3) values consideration of multiple sources of knowledge, especially local.

Despite the shortcomings of BO, voluntary BO was written into the Finnish nature conservation law recently in 2023. Therefore, it is likely that there will be more cases of urban BO in Finland. To improve social fairness and acceptability of BO, it is crucial to engage with the affected community at an early stage and to foster participation throughout the zoning process, in which the offsetting is integrated from the start. There needs to be room for the locals' collective agency and open deliberation without the restraints of pre-determined parameters of BO. Insufficient stakeholder participation has been identified as a recurring flaw in offsetting practices (Taherzadeh and Howley, 2018; Apostolopoulou and Adams, 2019; Apostolopoulou, 2020). One of the biggest causes of resentment for the Kytölä residents was that they felt excluded from the zoning process. Only years later did they discover that offsetting had been included in the development plans unbeknownst to them. BO will not achieve local acceptance unless residents and other affected groups are given genuine opportunities to influence the development plan that is being offset.

Our results clearly show that residents attach irreplaceable values to nearby greenspaces. Offsetting the loss of these values is unfeasible, since residents see development as a threat to their cultural identity (Scholte et al., 2016). Based on our interviews, one positive aspect is that locals tend to have clear ideas of the most important aspects of their landscape for their wellbeing. Some of these aspects are embodied in well-defined special places that could be excluded from development. The ways to ensure their preservation can be jointly generated with the affected community.

Furthermore, the acceptability of biodiversity offsetting depends on how it is framed and introduced. From a resident's perspective, mitigation hierarchy feels more *honest*. Consequently, a failure to demonstrate that adequate measures have been taken to avoid or minimise the losses means that offsetting is more likely to increase locals' distrust of city officials. In our interviews, the Kytölä residents were unable to recognise that mitigation hierarchy was followed in the planning process, and the following offsetting scheme only spurred further discontent. Residents' inability to detect any steps of avoidance or mitigation pertains to the lack of communication of these measures to the affected community. To ensure the recognition of these steps, allowing the affected community to participate in defining what kind of measures of avoidance and mitigation are sufficient can improve transparency and acceptability.

In terms of the technicity of BO, it may be advantageous for residents to understand the calculation of ecological values to improve acceptability. However, it is questionable whether such an understanding will address the underlying issue: residents will continue to not have a say in how these values are calculated, even if understanding the valuation process improves transparency. There is an issue of co-optation here: even if the residents were able to engage in technical debates regarding the values assigned to greenspaces, they would be co-opted by the scheme, and the framing of the debate would still be about the valuation for BO. Consequently, this framing limits the public debate. In the end, in terms of acceptability, developing a valid way to measure and relocate ecological values is of secondary importance to building trust and reciprocal understanding between the city officials and residents.

6. Conclusion

Throughout our investigation into the social aspects of BO in urban contexts we have questioned what new BO adds to or requires from existing urban planning procedures. Ideally, the planning process should empower residents, be equal and equitable, participatory, transparent, and incorporate multiple different values of greenspaces. Based on our data, both residents and the city officials of Lahti share this vision. However, the Lahti pilot fell short of this ideal. The pilot was largely an exercise in learning by doing, and one of the main outcomes was the lessons learned from its shortcomings. Nevertheless, it is not meaningful to separate the pilot BO from the context of standard, everyday urban planning. Our findings identify some key lessons to improve such offsetting in the future. However, the results also challenge the notion that BO can fix social-environmental conflicts in urban planning. We attribute our argument to the depoliticisation of nature inherent in BO, where the technocratic measuring of ecological values overshadows the multiplicity of social values and meanings held by urban greenspaces and nature. BO, in its current form, reinforces this division rather than addresses it.

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CRediT authorship contribution statement

Kaisa J. Pietilä: Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Iikka Oinonen:** Writing – review & editing, Visualization, Investigation, Formal analysis, Data curation. **Suvi Huttunen:** Writing – review & editing, Supervision, Project administration, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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