

VALUE INTEGRATION THROUGH SOCIAL INNOVATION IN BLUE-GREEN INFRASTRUCTURE PROJECTS

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Blue and green infrastructure (BGI) projects such as rain gardens, green roofs and water squares, embody a variety of values such as technical (drainage), environmental (biodiversity), economic (property development) and social (health and wellbeing). Because these values have proven to be challenging to integrate, local governments are increasingly experimenting with social innovation (SI) as a bottom-up form of value integration. Because we lack knowledge about different ways of how value integration is achieved, we compare four BGI city projects in North-Western Europe that share the ambition to realise BGI through SI. The findings reveal that social innovation leads to four ways of value integration: materialistic, human, organisational and process. These value integration arrangements unfortunately seem to mainly contribute to greater alignment between values rather than true value integration. Our research helps to better detect where and when public values are dealt with in BGI projects.

Keywords: adaptation; value integration; social innovation; blue-green infrastructure

INTRODUCTION

To integrate multiple interests in various construction related challenges, such as climate change, the green deal, digitalisation, achieving circularity, new forms of collaboration between public, private and societal stakeholders are needed). Especially in climate-proof and sustainable urban planning projects, interdependency grows, and actors must coordinate their activities in seeking for interventions that integrate multiple objectives and values (Van Broekhoven, Boons, Van Buuren, and Teisman, 2015). One of the current urban developments that is seeking value integration are Blue and Green Infrastructure (BGI) projects. These are nature-based solutions such as green roofs, water squares or raingardens that aim to make cities more climate resistant (Willems, Kenyon, Sharp and Molenveld, 2020). The multi-functional nature of blue and green infrastructure projects brings goals from different policy arenas together: it does not only offer water management benefits (e.g.,

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improvement of urban drainage), but can also improve the quality of life in cities (e.g., urban regeneration, biodiversity, economic development). Yet, value integration in BGI projects has proven to be difficult, underscoring the need for better coordination in this domain. Coordinating the actions of government organizations across policy sectors has always been an important task in safeguarding the quality of our built environment (Molenveld, Verhoest, Voets, and Steen, 2020). This coordinating responsibility has only become more urgent because society is increasingly faced with complex, multi-dimensional challenges such as climate change and resource scarcity (Candel and Biesbroek, 2016). Hence, these challenges cannot be addressed by one governmental organization or policy domain alone (Molenveld *et al.*, 2020) but require collaboration with private or societal parties in order to align or integrate the different interests and translate these interests into values for a project.

A recent, promising form explored by local governments for better value integration is social innovation (Pel, Haxeltine, *et al.*, 2020). Social innovation (SI) combines technical, social and economic objectives through which governments strive to achieve broader goals for both public and private parties (Karré, 2018). It refers to new approaches for dealing with social challenges that come about through networks and joint action in social domains, outside the systemic world of government and the business logic of the corporate industry. Social innovation goes further than crossing various governmental boundaries and can offer different pathways regarding value integration by involving different stakeholders and engaging with various value systems; from public institutions under public procurement law, public and private organisations in their socio-technical environment, to residents in their societal context (Karré, 2018). However, the convergence of different values of stakeholders also means a greater likelihood of value conflicts, due to the incommensurable and incompatible nature of values, making value integration more difficult (Kuitert, 2021).

Previous research has argued that no consensus exists on what value integration actually is and how it is achieved. In this context Keast, Brown, and Mandell (2007) argue that a failure to understand the attributes of the various integration modes and adequately match their mechanisms and processes with the stated purpose and context has contributed to the limited success of integration strategies. We do know quite a lot about top-down bureaucratic innovation to strive for value integration, such as through policy integration (Candel and Biesbroek, 2016). Because we lack knowledge about different ways to organizing value integration in the context of social innovation, this paper aims to understand how the multiple values of Blue Green Infrastructure projects can be captured and sustained in the process of social innovation.

Our research question is: How can the multiple values of BGI projects be integrated through the process of social innovation? To answer this question, we combine theoretical insights from social innovation literature (Karré, 2018; Wittmayer *et al.*, 2020) and literature on hybridity and public value management (Christensen and Lægread, 2007). These insights are brought together to analyse four BGI projects in three different European countries. A cross-case comparison led to the identification of four arrangements - materialistic, human, organisational, processual - that local authorities are experimenting with to integrate value by utilising different ways of the hybrid features of social innovation. Findings, however, also show that these value integration arrangements appear to lead to increased alignment of different functionalities rather than true value integration.

THEORY

Value integration for BGI project

Blue Green Infrastructure, such as green roofs, water squares or raingardens, is usually a responsibility of the domain of urban water management at a local government level. A pitfall is, however, that wider benefits of BGI are often added as an additional goal to existing ambitions, and then to some extent lost to other goals, such as financial feasibility and construction goals (Pel, Wittmayer, Dorland, and Søgaard Jørgensen, 2020). For example, the employment of local youth in green space management may be hampered by strict social return regulations. This ‘adding on’ is also recognized in a recent study into commissioning in the construction industry, in which new values were often achieved through existing value systems rather than establishing new value systems (Kuitert, 2021). e.g., when social return objectives have been achieved through a physical redevelopment project. In addition, public actors have limited tools except stimulation or dedicated managerial actions, to actively implement new values to adjust their value pallet (Meynhardt, 2009). Moreover, existing management approaches, such as contractual mechanisms, create hard boundaries to limit risks, for example, and thus offer little room for new values that require greater cooperation (Kuitert, 2021). So, despite their often-commendable intentions, governments continue to struggle to distance themselves from old rational-technical approaches to value decision-making and adopt approaches that does justice to the dynamic interests of the entire network and contribute to the larger system (Keast *et al.*, 2017).

One reason for this is that new approaches are at odds with established bureaucratic norms and practices, leading to trade-offs between values instead of balancing or integrating values (Kuitert, 2021). This also has implications for the spectrum of value integration, ranging from alignment to true integration. To understand the different degrees of integration, Jørgensen, Remmen and Mellado (2005) studied different approaches to integration in management systems and distinguished three levels of integration: aligned, coordinated and integrated. First, alignment concerns a parallelisation of the systems using the similarities of the standards to structure the system, in which compatibility is increased and standards are combined in a management document (Jørgensen *et al.*, 2005).

This compatibility element corresponds with Besharov and Smith’s (2014, p. 365) framework that demonstrates that both the nature and extent of conflict depends on the type of logic multiplicity within different categories of organizations. One of the dimensions that delineate heterogeneity in organizations is the compatibility - the extent to which the instantiations of multiple logics within an organization are suggestive of consistent organizational action. This degree of value integration combines values, but separate procedures remain. Second, the next step towards integrated management is through internal coordination aiming to reduce the possible trade-offs. This leads to a ‘weighted balance’ in values, which could be quickly degenerate into the pursuit of the sum of individual customer wishes (Stoker, 2006). Third, full integration is achieved by creating a culture of learning, stakeholder participation and continuing improvement (Jørgensen *et al.*, 2005). This is where added value is sought, going beyond the formal rationalities and thus the classical economic view with its typical cost-benefit and multi-criteria approaches (Kuitert, 2021). Added value is achieved when the integration of values leads to enhanced value for each objective within the integration (Stoker, 2006).

Social innovation as a counterpart of bureaucratic innovation

Value integration can be achieved through different forms of innovation: top-down bureaucratic innovation, followed by implementation, and bottom-up social innovation aiming to create organisational support during the process of project delivery. Social innovation (SI) includes various non-technological innovations and active contributions from consumers, citizens and organizations that go beyond the actors of a traditional construction project (Wittmayer *et al.*, 2020). SI for BGI projects is primarily aimed at improving social outcomes and creating public value by combining technical, social and economic objectives that together form new functionalities that move beyond urban drainage (Karré, 2018; Willems *et al.*, 2020). This kind of multi-functionality gets achieved through internal and external hybrid relations (Willems *et al.*, 2020).

Hybrid organizations are multifunctional entities that combine different tasks, values and organizational forms (Christensen and Lægred, 2007). In this paper, hybridity is approached in terms of “the ability of organizations to incorporate elements from contradictory institutional logics over time, and thus as the organizational processes through which this incorporation is managed” (Fossestøl *et al.*, 2015, p. 290). Internally, SI means cutting across boundaries, the integration of different policy domains within local governments. Externally, SI means creating compelling new relationships through higher stakeholder involvement (Mulgan *et al.*, 2007). Kraatz and Block (2008) argue that, because the hybrid organization is a composite of multiple institutional systems, its internal functioning is thus reflective of the contradictions between the larger systems themselves. Actors must coordinate their activities and seek for interventions that integrate multiple objectives (Van Broekhoven *et al.*, 2015).

Social innovation may be seen as the counterpart to bureaucratic innovation. In bureaucratic innovation, value integration often takes the form of policy integration. Tosun and Lang (2017, p. 559) define policy integration as “policy-making in certain domains that take policy goals of other, arguably adjacent, domains into account”. The question remains whether integration is only a strategic concept, or whether it can also take place operationally, tactically, or even between individuals within a firm. We consider policy integration as an activity taking place at the strategic decision-making level, so value integration as bureaucratic innovation takes place here and has subsequently to find a way through the organisation and the project network. Value integration as social innovation, in contrast, can occur at different levels. SI may start either top-down or bottom-up - either within the organisation or in an (internal-external) network - and strives to ensure that the value integration being pursued is picked up by the organisation and is mainstreamed throughout the organisation.

Therefore, SI for complex social issues quickly becomes challenging when confronted with traditional forms of subsystem policymaking within hierarchical systems of governance that have more narrowly defined value systems (Candel and Biesbroek, 2016). Looking at pathways to value integration, one has to incorporate the process of pursuit better. We therefore adopt a dynamic, relational perspective in order to take into account the value dynamics present in SI. More static approaches to value management consider how are managed are deliberate and purposeful (Stewart 2006; Williams *et al.*, 2020), which dismisses the value dynamics that Pel *et al.* (2020), for example, focused on when studying how SI initiatives renegotiate both organizational and institutional boundaries in a relational framework and with a process-theoretical approach respond to the emergent, distributed and institutionally hybrid characteristics

of social innovation. In this case, changes to the way values are managed can be emergent (Stewart 2006). This connects to literature on adaptive governance, where it gets explained that changes in the ways values are managed can be emergent, e.g., new patterns of organizational or individual action reflecting shifting societal values, or purposeful, e.g., deliberate policy changes in response to new understanding of values (Williams *et al.*, 2020).

RESEARCH APPROACH

To analyse which value integration approaches are used in the social innovation process, we performed an explorative comparative case study of four Blue and Green Infrastructure projects in different cities of three different North-Western European countries - Dordrecht and The Hague (both in The Netherlands), Antwerp (Belgium) and Goteborg (Sweden), see Table 1. The cases share the ambition to realise multiple goals of BGI through SI. In addition to achieving their urban water management and green space management goals, the cases aim to obtain social and economic objectives as well, such as fostering public health, facilitating recreation opportunities, and city branding. In-depth case study research allows for acquiring in-depth, context-specific knowledge (Yin, 2003), which is crucial for understanding value integration in practice.

Table 1: The Blue and Green Infrastructure cases

Project	Vogelbuurt multi-functional park	Cromvlietpark multi-functional park	Sint-Anneke Plage Living lab	Jubilee Park, Frihamnen Temporary land- uses
City, country	Dordrecht, NL	The Hague, NL	Antwerp, BE	Gothenburg, SE
Period of time	2018 - current	2017 - 2021	2017 - current	2013 - current
Value integration Project goals	Goals related to climate adaptation, biodiversity, recreation and public health.	Creating greening in which goals related to social return and climate resistance.	Combining climate adaptation measures with socio-economic redevelopment.	Climate awareness-raising, social wellbeing and city branding.
Participating actors	Municipality, housing association, neighbourhood organisation, Sports Council	Municipality, A group of local small and medium-sized enterprises, a resident panel, intermediaries	Municipality, Waterway Agency, local entrepreneurs, designers, nature preservation NGO	Municipality, River City Company, designers, residents

In total 24 semi-structured interviews with various public and societal stakeholders have been audio taped, transcribed verbatim and analysed in Atlas.ti. To explore the different value integration pathways, we looked into what happened with both climate adaption goals and wider societal goals when delivering the multi-functional BGI projects through social innovation. Existing ambitions regarding climate adaptation may be complemented with new goals that, for example, improve health and wellbeing or provide recreation facilities. Applied to BGI, core values in urban water management, such as its technical orientation and cost-effectiveness, have to be connected to different commercial and social values. Using an inductive coding technique (Locke, Feldman, and Golden-Biddle, 2020), engaging with data first before subsequently looking for patterns, allowed us to capture the way in which value integration. We distinguished four arrangements that local authorities are experimenting with to integrate value by utilising different ways of emerging, distributed and institutionally hybrid features of social innovation - materialistic, human, organisational, processual value integration. These arrangements were analysed in the context of the potential of achieving social and sustainable value

through more traditional existing value systems in comparison with achieving these goals by building new value systems. We coded where, when and how societal, environmental, economic and technical values came together and analysed what this meant for the degree of value integration as identified by Jorgensen *et al.* (2005): single value, combined value, balanced value, or added value.

FINDINGS

Our analysis demonstrated that local authorities are experimenting with different ways of integrating value by utilising the emerging, distributed and institutionally hybrid features of social innovation in different ways. We inductively identified four ways of value integration in the BGI projects, which we call a materialistic, human, organisational and processual arrangement. Each arrangement will be discussed further below.

Materialistic value integration

We recognized several materialistic ways to achieve value integration through social innovation. In Dordrecht, for example, the municipality and housing association leaned on a social organisation located in the neighbourhood who strived for more green space to prevent heat stress and support water storage. This intermediary was very involved with the residents and, in order to stimulate residents taking out pavement in their garden and plant green, they lent out garden tools. This was mainly done because they could not expect residents to buy a lawn mower or pruning shears for this kind of small green spaces but also occurred because of the limited financial situation of most of the residents. In Gothenburg, the municipal project team co-developed prototypes of green infrastructure with local residents in order to raise awareness and get people involved with the design and maintenance of their environment.

Human value integration

Another set of value integration arrangements was more human in nature. Most municipalities and other involved semi-public organisations used intermediaries to integrate system world logics and life world logics. These were mainly social organisations that also had an (intrinsic) motivation for climate issues. Some of these organisations were sometimes already a partner of the municipality, but now took on a different role as intermediary in these SI processes. Both in Dordrecht and The Hague the intermediary was used as a ‘connecting’ figure - the eyes and ears in the neighbourhood with a strong local network and also a network in the system world. In Dordrecht, the squatting past ensured that there was an intrinsic motivation to improve the climate, and in The Hague, this merely came from the external connections. In Antwerp and Gothenburg more established sustainable entrepreneurs were used. In Gothenburg, a group of more holistic thinking colleagues came together in a freestanding municipal department which aimed at the construction of blue-green infrastructure projects, yet always combining this with a human perspective (broader goals vs. climate goals). In Antwerp a non-profit but (partly) publicly subsidised local entrepreneur advised on sustainable construction, residence and living. Their campaigns proved to be especially useful in raising awareness for climate change.

Organisational value integration

New organisational arrangements were also recognized introducing different ways of working. In Dordrecht, a programmatic approach has been chosen that transcends the various departments. A specific group with the responsibility to create more "Blue and Green" throughout the city had the task to "work themselves jobless", ensuring

that their perspective was widely supported and integrated into the organization. Collaboration was pursued both within and outside the municipal organisation, which led to an increase in coordination considerations. For example, one of the interviewees mentioned that when a certain way of organising worked better for the sports clubs, it was chosen. Yet, this today still leads to a lot of alignment, rather than true integration by collaboration. In Antwerp, the municipality worked with integrated work groups on urban renewal, and especially the dedicated participation department breaks into other policy arenas, while in The Hague, the innovation was merely found in the composition of the multi-perspective project team.

Processual value integration

Finally, our analysis showed how different innovative processual elements can lead to new ways for value integration. In Dordrecht, workshop sessions to pile up all tasks and contextual conditions were organized from where opportunities are indicated per neighbourhood. In the other cities, different ways of communication were also visible. Another processual integration option was seen in the combination of old and new forms of participation. The practicality of the physical output of the innovative participation trajectories in The Hague and Antwerp made it easier to get the municipal organization on board, whereas the general participatory regulations remain quite abstract. The exploration of new participation methods within the current participation regulations was also sometimes limiting. Especially the temporary nature of some experiments, for example in Antwerp and Gothenburg, allowed for broader exploration, with the risk of never getting embedded.

Impact of value integration arrangements

Looking at the impact and degree of value integration of the different arrangements, in each of the four cases it became clear that despite the aim for value integration, one value or goal remained to be leading. We found that when the main goal comes from the technical department, acting as the ‘owner’ or asset manager of the water tasks, the management approach was often more traditional mono-value oriented. In Dordrecht, for example, the municipality affiliated with the demolition and new construction of the housing association using their sewer replacement to also urge greening. The local sports council, in turn, then used this to ‘go with the flow’ and to ‘riding the wave of water storage’ in order to improve their sports park and make it more attractive to non-members as well. In Antwerp, the water issue was central, and it was discussed that one could ‘load things integrally’. Water was seen as a ‘good entry point’. . . Alternatively, when the social perspective was leading, e.g., creating climate awareness, the pursuit of common goals was more natural, and a broader view was taken. Furthermore, an intermediate form of impact on value integration was seen when the climate goals were strived for with a spatial department in the lead.

Although in a quite pragmatic way, the spatial challenges generally proved to be approached integrally, leading to explicit value trade-offs with regard to functionalities and other aims. In Goteborg, the Goteborg2021 and Jubilee-park were located in the former harbour area Frihammen, where the temporary character offered increased 'space' for value coordination. In The Hague, social goals like social return on investment were especially strived for by aiming to involve for example apprenticeships for local residents in the execution of spatial development, trading off against other types of values than normally in the social domain. The case of Antwerp centred on the private safeguarding of green through ‘uplifting’ rules about accessible square meters of green per resident. The canopy was used as a lever to ‘surf along’ with the current initiatives. This shows that the social innovation was either initiated

from the perspective of water infrastructure, or from the perspective of green infrastructure, which appears to influence the degree of value integration.

The findings also show the dependence of higher organisational levels to achieve value integration. We found that formal value integration mainly took place at strategic levels, while being aware that the operational impact was kept unsure until today. In Dordrecht, for example, a specific vision was created which was picked up by directors and explained to be important for the alignment with the city of Dordrecht as a whole. However, it was also expressed that the translation into the neighbourhood level remains a challenge that still needs to be taken on. In Gothenburg, interviewees indicated that it was also all about the coordination of visions and learning their partners how to work in accordance with the new vision. In Antwerp, it was discussed that civil servants needed to ‘sell’ the climate adaptations by emphasising the flooding in certain neighbourhoods from a safety perspective. Safety was one of the core municipal values in Antwerp.

Their rather progressive spatial structure plan with a ‘soft spine’ was in line with their blue-green ambitions and therefore provided these aims with a serious position on a strategic level. Because the elaboration of a green and water plan was a must-have of this spatial structure plan, this resulted in looking at water in a spatial way, emphasising liveability and heritage of the city. In the Hague, the combination of the construction of a city park with high social return ambitions even came from the political sphere, initiated by a local alderman who wanted to boost the relatively poor neighbourhood. Furthermore, we found that when the opportunity had risen to find additional finances that would cover a gap in the project budget, a climate adaptation section was added to the climate plan. Getting in at the right time also appeared to be important when looking at the possible impact on value integration. For example, in Antwerp a discussion was going on about the canopy of a road that also offered opportunities for green roofing. This was easier to enforce now due to the existence of regulations about the proximity of several square meters of green space per inhabitant. In Gothenburg, the 400-year anniversary brought opportunities to see where things are already happening and get involved, and to find out during the timeframe what is needed and what is required.

CONCLUSIONS AND DISCUSSION

Based on our study of four case studies of Blue and Green Infrastructure projects in different Northern European cities, we saw that overall social innovation opens up new ways of value integration in addition to already established top-down bureaucratic ways. These value integration arrangements, however, seem to mainly lead to increased alignment of different functionalities so far rather than true value integration. Hence, integration does not always mean added value for a city because the wider benefits seem often considered to be add-ons: they are often added to BGI project as an additional goal to existing ambitions and then, to some extent, lost to other goals. Due to accountability structures of a specific main value, the decision making often remains from a single or dual value perspective. The pattern of bumping up against systems is similar to the trend we see in the implementation of new values in project commissioning of public construction clients (Kuitert, 2021). The conflicting nature of values makes it increasingly complex to manage projects that contribute to today's transition issues such as climate adaptation.

This paper provides insights in the barriers of how to go from add-ons to integrated value decision making, and thus how to move towards systematic Blue and Green

Infrastructure. Overall, in the long run, this could mean that new value systems do not replace dominant institutions, but they do challenge and sometimes even alter dominant logics in governmental decision-making. In that case, there will not be transformative change (Pel *et al.*, 2020). Yet, values have been said to be a good entry point for investigating changes in the contemporary public sector.

Like Ford *et al.*, (2019), we argue that a first step in the task of incorporating public values in planning is to detect where and how values are already dealt with in decision-making processes, whether policy makers are conscious of considering values, or not. Further research could look into this kind of long-term institutional change. The findings also suggest that the problem with blue and green infrastructure projects seems to be that insufficient stakeholder integration leads to suboptimal value integration. The shift from a relatively static outcome-oriented approach to a differentiated dynamic understanding of integration allows for further research to deepen understanding of when integration is fully realised, what elements constitute integration processes, and how they can evolve over time (Candel and Biesbroek, 2016). Further research could address to what extent different modes of stakeholder integration led to types of value integration throughout the process of public service delivery, and vice versa. This contributes to knowledge on how local governments combine conflicting value systems, which is especially important for public managers who should be able to balance and reconcile conflicting objectives in realising societal challenges in the built environment.

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