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Successful Project—Limited Transfer: Learnings from the Local Circularity Experiment WiedergeBORN

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Abstract: The paper presents an evaluation of the strategic experimental project "WiedergeBORN", conducted by Stadtreinigung SRH, Hamburg's public waste management company, with stakeholders and citizens in the Osdorfer Born large housing estate. Based on an analysis of the case study, which included document analysis, observation and interviews, the article delineates the genesis of the project, its main stakeholders, and its objectives, measures, and outcomes. Success and failure factors of the project and the possible transfer of lessons learned are then categorized and discussed using the four pillars of accountability as an analytical framework. The place-based approach, which considered local conditions, the close cooperation between key stakeholders, and the early involvement of local actors and citizens, supported the successful development and implementation of measures to improve waste management and cleanliness. Furthermore, the integration of environmental, social, and educational aspects in the measures and the cooperation with actors from these fields were demonstrated to lead to positive outcomes. The transfer of the project's results and approach remained limited due to a lack of involvement of strategic actors in the project; this hindered an integration of the participating stakeholders into strategies and into policies at the district or city levels.

Keywords: circular economy; experiment; strategic planning; accountability; participation

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1. Introduction

In the discussion of how to address the challenge of climate change, the importance of circular economy (CE) and improved waste management as contributions to climate mitigation has been emphasized. Earlier studies focused on the necessity to include measures to improve waste management in climate action [1]. More recent reports delineate the extended potential of circular economy approaches to contribute to climate mitigation in Germany [2] and the EU [3]. Others argued that CE contributions are key to reaching sustainability goals [4].

While the necessity to include CE in climate action on national and international levels is widely recognized in the scholarly discourse, research has demonstrated a lack of accountable action at the city level and a failure to integrate CE into strategic urban planning [5] (see Section 2).

At the same time, various studies have examined the role of urban experiments as a strategic approach to governing climate change in cities [6–8]. For example, Wirth et al. [9] and Bulkeley et al. [10] analyzed examples of urban living laboratories and how lessons learned from these experiments can be transferred into strategic urban planning. Some of the studies on the role of experiments for strategic planning included experiments in the fields of CE and waste management, but their number is limited. Furthermore, the specific connection of CE and waste management to strategic urban planning has only become the subject of the scientific discussion more recently.

To contribute to this discussion, this article examines a case study at the local level, the strategic experimental project WiedergeBORN, which was conducted by Stadtreinigung SRH, Hamburg's public waste management company, in Osdorfer Born in Hamburg, a

large housing estate, and involved various stakeholders and citizens (see Section 4). The goal of this experimental project was to foster CE by improving waste management locally. The WiedergeBORN project is elaborated and examined in this paper to outline what can be learned from this case about the integration of CE into strategic urban planning. The case study is analyzed using a methodological mix of document analysis, participatory observation, and interviews (Section 3). The aim of the presented research is to analyze and understand the success and failure factors of the strategic project, and to learn from the project for potential transfer and replication. The accountability framework [11] is used to categorize the results of the analysis, to discuss possibilities of replication and scalability beyond the experimental project, and to indicate their potential for integration on the strategic planning level (Section 6).

To answer the research question, the article is subdivided in the following sub-questions:

- What are the lessons learned and what are the success and failure factors of the project (Section 5)?
- How are the lessons learned perceived by the key stakeholders with regard to potential continuation and transfer of the results of the project (Section 6)?
- On a conceptional and methodological level: What are the potentials of the categorization and assessment of the results through the accountability framework (see Section 2) to enable the transfer from the experimental level into strategic planning (Section 7)?

2. Accountability of the Circular Economy in Cities

CE is a relatively new paradigm that is rooted in the broader concept of sustainability [12,13]. More specifically, CE draws upon the concept of Urban Metabolism (UM) [14], which describes cities as open systems exchanging resource flows with their environment [15]. While UM is mainly a descriptive paradigm, CE offers a conceptual framework for managing flows [16]. The Ellen MacArthur Foundation [17], among others, translated CE into policy recommendations and has been widely adopted by the European Union in the EU action plans for the CE 2015 and 2020 [12,18].

Despite its roots in UM, CE-related policies initially mostly ignored the accounting of effects of CE on the (urban) space and vice versa [19]. Noting this gap, scholars have argued that the spatial dimension of CE needs to be stressed when handling flows in urban areas since every action undertaken inevitably implies changes to the land(use) [20,21]. Girardet [20] connects the concept of CE with urban development approaches in his regenerative city concept. Additionally, William's [19] circular cities concept highlights the deficits of CE in the incorporation of spatial and social questions. On this basis, Williams later suggests evolving CE into a circular development approach that should expressly include a spatial perspective for urban planning strategies and, thus, enable a sustainable development towards circularity. Further authors propose that urban planning as a discipline should incorporate CE perspectives into the discourse on spatial development at the city level [5,22,23], while others claim that urban regions are the most suitable scale to act for the concretization and spatialization of CE [24].

The scientific and policy discourses on the necessity of a stronger consideration of spatial aspects in CE policies and actions have inspired cities to develop their own strategies and policies that combine CE and spatial development (e.g., Amsterdam). Consequently, spatial aspects have also been integrated into EU policies on CE, the foremost of which is the 'New CE action plan 2020', and this has led to the creation of the European 'Circular cities and regions initiative CCRI' [18]. The latter has stimulated numerous local and regional activities to develop and test CE (e.g., in the form of living labs), and initiated further EU-funded research. With regard to these recent activities, Williams underlines the need for more research on spatial implications of CE and the role of spatial planning in steering governance processes to support circular development [5,23].

Recent work in the field discusses the process of implementation of CE strategically in cities and links it to the question of how to assess these processes [21,25]. The accountability

framework is one method that has been used to assess strategic planning related to climate action. It centers the relationship between the principal (the citizens) and agents (state, public institutions) in its analysis of strategic planning and actions. Furthermore, it enables a polycentric governance perspective on strategic planning processes, meaning that, in the relation between citizens and state, several institutions can represent the public side and, also, interactions among them can be considered [26].

In the application of the accountability framework, Zengerling proposes four pillars to analyze accountability [11]. In the first pillar, "responsibility", the relationship between the principal (the citizens) and agents (public institutions) is examined with regard to the strategic planning project. Clear responsibilities between the stakeholders and the citizens are important for the successful implementation of a strategic project [11,27]. As the case study WiedergeBORN was an experimental strategic project involving several public, private, and civic stakeholders, not only the relation between the principal and agents, but also the responsibility relations between different stakeholders as agents are considered. The second pillar, "transparency", focuses on questions related to communication and information flows between principals and agents, similar to the other pillars between the different stakeholders (agents) in the strategic project. In the third pillar, "assessment", the focus is on data in relation to the strategic project and its objectives. Lastly the fourth pillar, "participation", examines the involvement of citizens in the strategic project and of stakeholders in the decision-making process [11,27]. An assessment of a strategic CE project using this framework allows for a nuanced depiction of the processes of the project implementation, beyond a merely technical or regulatory approach, and provides insights into the potential for transfer of project learnings and results.

3. Methods Applied and Accountable Strategic Planning as Conceptual Frameworks

The case study, the experimental strategic project WiedergeBORN, was analyzed using a methodological mix: participatory observations during meetings, workshops, and public events (see Table 1), and field studies, including spatial observation and analysis of the area (implemented built measures, impact on cleanliness, see Section 4) before, during, and after the project [28,29]. A document analysis was performed, drawing on data reports, unpublished minutes of workshops, plans, stakeholders' policy concepts and newspaper articles. After the end of the project, three semi-structured qualitative interviews with the key stakeholders involved in the experimental project, Stadtreinigung Hamburg SRH and SAGA/Pro Quartier PQ (see Section 4.3), were conducted to reflect on the project's activities, outcomes, lessons learned, and possible transfer and replication of results (see Supplementary Materials File S1: Guideline for interviews with key stakeholders). The interviews were recorded and transcribed. The transcribed interviews were subsequently analyzed using qualitative content analysis [30,31]. The interviews had two aims: to complete and clarify information on the measures and their immediate outcomes (see Section 5), and to evaluate the factors contributing to their success or failure. The interviews, documents, and minutes were then examined following the four pillars of the accountability framework, described in Section 2. The results of the analysis are presented in Section 6.

Table 1. Effective and potential waste disposal for different waste fractions and different neighborhoods.

Waste in kg per Year and per Capita	Osdorfer Born	Ottensen	Altona-Nord	Blankenese	Lurup
Sum of waste collected	367.9	352	243.7	306.9	277.1
Disposed effectively in recyclables bin	20	44.8	8.4	47.1	15.2
Disposed effectively in paper bin	66	68	10.5	49.8	57.6
Disposed effectively in residual waste bin	269.4	216.7	182.4	104.7	176.5

Table 1. *Cont.*

Waste in kg per Year and per Capita	Osdorfer Born	Ottensen	Altona-Nord	Blankenese	Lurup
Disposed effectively in organic waste bin	12.5	22.5	42.4	105.3	27.8
Ideally disposed in recyclables bin	42.3	46.1	25.3	28.5	36.8
Ideally disposed in paper bin	79.8	81.3	23	58	71.5
Ideally disposed in residual waste bin	111.4	116.4	59.6	42.2	56.2
Ideally disposed in organic waste bin	105.1	70.8	109.7	159.9	86.6
Ideally disposed in collection containers (glass, textile, WEEE)	29.3	37.5	26	26	12.8

4. The Case Study "WiedergeBORN"

4.1. The Experimental Project of WiedergeBORN

WiedergeBORN led to direct, measurable improvements in waste management and circularity in the local project focus area. These results hold special significance with regard to the discussion of the increasing importance of CE contributions to the achievement of sustainability goals and, especially, to the reduction of greenhouse gas emissions. This is of specific relevance in Hamburg, as the city has, to date, no circularity strategy, and its city-wide and district-level climate action plans largely lack measurable activities in the field of circular economy.

The results of the regular waste separation surveys of SRH had shown that the sensitivity for waste separation is relatively low in large housing areas like Osdorfer Born compared to other types of areas: dense historic area (Ottensen), dense post-war area (Altona-Nord), lower density multiple-family housing (Lurup), and single-family housing (Blankenese) [32]. Table 1 shows the amount of waste per year and per capita effectively disposed of in the bins for the different waste fractions, and the potential amount of waste per fraction that could be ideally disposed of in the correct bin. Osdorfer Born has the highest amount of waste in total, showing potential for waste avoidance. The gap between effectively and ideally disposed organic waste and recyclables is the highest compared to the other areas. Therefore, the key stakeholders decided to conduct the experimental project in the large housing estate Osdorfer Born [32].

The key stakeholders chose Osdorfer Born for the experimental project because of its characteristics as a large residential area with a population that is culturally mixed, economically rather poor, and with a comparatively low level of education.

Table 2 shows a summary of the main spatial and socio-economic information for different neighborhoods in the district Hamburg-Altona that were compiled in the frame of the REPAiR project and were the base to choose Osdorfer Born as the area for the experimental project. Data sources are statistical profiles for Hamburg's neighborhoods and districts [33], and, for Osdorfer Born, the evaluation report for social development programs [34].

The WiedergeBORN project was conceived within the research and sustainability unit of Stadtreinigung SRH in two Horizon2020 projects: FORCE and REPAiR. SRH adopted ideas for circularity solutions and place-based concepts that were developed in REPAiR, a more research-oriented project, and applied these in the more practically-oriented project, FORCE, which had a dedicated budget for the implementation of concrete measures on the ground. Table 3 shows the timeline of the project. A major motivation for the research and sustainability unit was their recognition of SRH practitioners' needs for tangible project actions and results. Based on an earlier waste separation analysis [32] and a socio-spatial study conducted in REPAiR, as well as the place-based solutions that had been developed in the REPAiR project for different areas, the research and sustainability unit selected the large housing estate Osdorfer Born as the implementation site. SRH chose Osdorfer Born, first, because the waste separation analysis showed a low compliance with waste separation policy in the community, and, second, because of their ambition to work in an area that is considered more challenging. Osdorfer Born is among Hamburg's lowest income communi-

ties. Thus, this project was an attempt to demonstrate measurable improvement in an area with a clear waste problem, while also improving service and support to a community with a high level of need. At an early stage, outreach was performed with further stakeholders, such as SAGA, Hamburg's public housing company, and Pro Quartier (PQ), a subsidiary company of SAGA offering services like neighborhood management. They also agreed to participate in the project and in the choice of the project area. The objectives of the project were to improve circularity in the area with a focus on waste management and cleanliness through the development and implementation of place-based solutions with citizens and the involved stakeholders. The project name "WiedergeBORN" refers to Osdorfer Born and is a play on the German word "wiedergeboren", meaning "reborn".

Table 2. Main spatial and socio-economic information for different neighborhoods in the district Hamburg-Altona.

Indicators	Osdorfer Born	Ottensen	Altona-Nord	Blankenese	Rissen	Altona District
Population [n]	10,263	35,370	22,137	13,407	15,192	273,263
Population density [inh/km^2]	11,591	12,654	9981	1733	909	3469
Population over 65 years old [%]	18.0	13.4	10.1	27.2	30.6	18.0
Foreign population [%]	26.4	13.1	18.8	8.3	7.3	16.1
Population with migration background [%]	63.8	26.0	36.0	17.1	16.9	32.0
Annual average income per taxpayer [EUR]	17,480	40,830	29,901	117,139	65,855	48,620
Unemployment rate (between 15 and 65 years old) [%]	11.8	4.4	7.2	1.9	3.5	5.9

Table 3. Timeline of the project WiedergeBORN.

Date	Activity/Event
2017–2019	Co-creative process in REPAiR living lab; first analysis of place-specific waste and circularity problematic and potential in different areas in Hamburg
19–22 June 2018	Student workshops at HCU and TU Delft as part of the REPAiR project to develop solutions to improve circularity in Osdorfer Born and other different areas in Hamburg
January–May 2019	Idea for WiedergeBORN as a project focusing on the specific area of Osdorfer Born was developed by SRH; using input from REPAiR (socio-spatial, waste analysis, eco-innovative solutions) and FORCE (input from other cities: Lisbon and Copenhagen)
5–9 August 2019	International summer school of the FORCE project with a focus on the development of WEEE (Waste of Electrical and Electronic Equipment) solutions for Osdorfer Born
June 2019	SRH establishes an internal team, local project manager starts work
28 August 2019	WiedergeBORN Kick-off Workshop (WS1) with key stakeholders; the core working group is established
September–December 2019	Survey of inhabitants conducted by SRH
September 2019–February 2020	First implementation of project measures and activities
17 February 2020	WiedergeBORN mid-term Workshop (WS2), first evaluation of activities
February 2020–February 2021	Continuation of measures and activities (limited due to COVID-19)
8–10 September 2020	WiedergeBORN Festival
8 February 2021	WiedergeBORN closing Workshop (WS3) with project internal evaluation of the results
Spring 2021	Postprocessing of the project: guideline for SAGA, SRH
Spring 2021	Attempt to achieve EU funding for follow-up project failed
From 2021	Usage of selected experiences and learnings from the project in other areas and project by the different partners (SRH, PQ)

4.2. Osdorfer Born the Case Study Area of the WiedergeBORN Project

Osdorfer Born is located in the northern part of the District of Hamburg-Altona, one of the seven districts in Hamburg that represent the municipal political and administrative level. In Hamburg, the districts take on many of the tasks that municipalities would elsewhere, as Hamburg, as a city-state, is one of the sixteen German federal states. According to the latest statistics available in the area, in 2016, Osdorfer Born had 4750 housing units for a total of 10,263 inhabitants [33]. Newer statistics are only publicly available for the larger administrative urban area Osdorf or for the larger social development area (Fördergebiet Sozialer Zusammenhalt) Osdorfer Born/Lurup [34].

Osdorfer Born was built in the late 1960s as part of the housing development program in reaction to the immense need for flats after the Second World War. It was the first large housing estate project of this kind built in Hamburg. It was meant to be a modern and livable place, offering social, educational, and cultural infrastructure and access to a big park area. A connection to the metro system, initially included in the plans, was not built due to the economic crisis in the 1970s, a fact that contributed to the poor accessibility of the neighborhood that lingers to today. Since the end of the 1970s, the share of households with higher incomes has decreased and the area has attracted more households with lower incomes due to its affordability. Osdorfer Born has become, like other comparable neighborhoods, a first place to find accommodation for many persons moving to Hamburg.

Until the 1990s, due to a lack of investment in renovation and modernization of the housing stock and public spaces, a process of physical downgrading occurred [35]. In reaction to this development, Osdorfer Born has received funding from different programs co-financed by the City of Hamburg and the German government since 1992 ("Revitalisierungsprogramm" 1992–1998; "Soziale Stadtteilentwicklung" 1999–2005; "Aktive Stadtteilentwicklung" 2005–2008; in parallel, from 2002 Bund-Länder-Programm "Soziale Stadt") [34]. Since 2014, Osdorfer Born, together with the adjoining neighborhood Lurup, has received funding from Hamburg's framework Programme for Integrated Urban District Development (Rahmenprogramm Integrierte Stadtteilentwicklung RISE) for neighborhood management programs and mainly social projects [34]. Additionally, SAGA has set up neighborhood management programs through its subsidiary company, Pro Quartier, to enhance social inclusion and to improve the built and natural environment [34].

According to the socio-spatial monitoring conducted by the City of Hamburg, Osdorfer Born is characterized by a significantly higher unemployment rate, a higher share of households receiving social welfare, and a higher school dropout rate than the Hamburg average [34]. Due to its characteristics, Osdorfer Born is considered to have a "low status" according to the latest social monitoring report published by Hamburg's Ministry of Urban Development and Housing, which is an improvement compared to the previous report where the area had a "very low status". Nevertheless, Osdorfer Born, together with Lurup, is again defined as a future funding area receiving support for urban regeneration [36].

4.3. The Stakeholders in the Project WiedergeBORN

The key stakeholders in the project WiedergeBORN were Stadtreinigung Hamburg (SRH), SAGA Unternehmensgruppe, and CHANCE and Pro Quartier (PQ), two subsidiary companies of SAGA.

Stadtreinigung Hamburg (SRH) is Hamburg's public waste management company. As stipulated by law [37], Stadtreinigung (SRH) manages the collection of household waste, street cleaning, winter maintenance services, and public toilets. Furthermore, it operates twelve recycling centers throughout the city, one of which is located next to Osdorfer Born. According to law [37], SRH is responsible for the collection and processing of household waste fractions [38]. These fractions are residual waste, which is collected and then incinerated to generate heat and electricity, and organic waste, which is brought to facilities for anaerobic digestion and subsequent composting to produce biogas and compost [39]. SRH is also responsible for collecting large or bulky household waste on demand, in exchange for a collection fee. Bulky waste is further processed at the recycling

centers. Still usable items (i.e., furniture) can be brought to second-hand warehouses operated by Stilbruch, a subsidiary company of SRH. Other waste fractions, including packaging, glass, and paper, belong to the so-called dual system and are collected by private companies, including by the SRH subsidiary company WERT GmBH [38].

SAGA Unternehmensgruppe (SAGA) is a public housing company, fully owned by the City of Hamburg, and is Germany's largest municipal housing company. In 2022, SAGA rented out a total of 138,656 flats in Hamburg, of which 30,187 flats were publicly subsidized, and 108,500 were financed without public subsidies (of which 102,121 were without limited rents and 6348 had limited rents). Circa 270,000 persons live in a SAGA flat, representing 14% of Hamburg's population. As SAGA offers moderately priced flats, it is considered to have a balancing effect on the rental flat market, offering housing to lower- and middle-income households [40,41]. In Osdorfer Born, SAGA owns 3600 of the 5100 total flats. SAGA has conducted an energy-efficient renovation and modernization of its building stock in Osdorfer Born over the last few years [34]. In its sustainability strategy, SAGA addresses the reduction of energy and water usage linked with the refurbishment of buildings as its main ecological concerns. Regarding the topic of waste reduction, a reduction in the amount of residual waste was observed between 2011 and 2018, but the amount has increased again since then. The separated waste fraction of paper and organic waste has continuously increased. The collected amount of all fractions grew significantly in 2021 compared to 2020, which can be explained by the lockdowns during the COVID-19 pandemic. In the sustainability reports, SAGA mentions only an intelligent waste management system in cooperation with external partners since 2004 and holds contracts with SRH for waste collection, while no concrete measures on waste reduction are described [42–44].

CHANCE (CHANCE Beschäftigungsgesellschaft mbH) is a subsidiary non-profit company of SAGA that employs long-term unemployed persons to reintegrate them into the job market. The employees work as service and contact persons for the inhabitants, mainly in large housing estates of SAGA and some estates owned by other housing cooperatives. The employees are located in so-called lodges and serve as contact points for the inhabitants. They offer concierge services to the inhabitants and inform the facility management and caretakers about problems like technical issues, vandalism, littering, and security [45].

Pro Quartier (PQ) is a subsidiary company of SAGA that offers services like neighborhood management, mainly in SAGA estates, but also in other areas. In Osdorfer Born, PQ are responsible for the neighborhood management of the large housing estate owned by SAGA and other housing cooperatives.

Table 4 lists the further stakeholders that participated and their involvement in the project.

Table 4. Further stakeholders involved in the project WiedergeBORN.

Stakeholder Name and Description	Cooperation in WiedergeBORN
Nutzmüll e.V., (Nutzmüll means "useful trash" in German) is an association that has been active for several years in the area in the fields of waste prevention and sensitivity.	In cooperation with Nutzmüll, various collection activities were conducted, for example, bulky waste collection and shopping trolley collection.
Kinder Museum, Hamburg's museum for children, is located in the area	Cooperation during the festival and workshops with children
Bürgerhaus, a community centre	Cooperation in several workshops and information events
Born-Center, a shopping center	Cooperation during the festival; exhibitions on waste prevention and recycling
Citizens	Individually cooperated, for example collecting waste or informing about illegal waste dumping
Westwind, local newspaper	Several articles were published
Recycling center/yard Osdorf, one of 12 recycling centers operated by SRH in Hamburg	Cooperation on bulky waste and other hazardous or special waste fractions

Table 4. *Cont.*

Stakeholder Name and Description	Cooperation in WiedergeBORN
Churches	Cooperation with, they were supportive. Participation in swap meets (Tauschbörsen)
Daycare centers (Kita)	Cooperation on composting project
Bücherhalle (public library)	Organized and staged puppet theatre for children about waste separation
Hamburger Volkshochschule (adult education center)	Cooperation during the festival; exhibitions on waste prevention and recycling
Borner Runde (community roundtable in the neighborhood)	SRH and SAGA presented WiedergeBORN; the round table was used for feedback, broader outreach, and connection with further initiatives and associations in Osdorfer Born
Parent-Child-Centre	Practical waste separation training
Geschwister-Scholl-Stadtteilschule, a secondary school	School workshops on plastic recycling
Precious Plastic Hamburg, a non-profit company	School workshops on plastic recycling

4.4. Development of the Measures

The main measures and activities of WiedergeBORN were created based on outcomes of analyses and ideas for solutions from the projects REPAiR and FORCE. They then were further developed in a co-creative process between SRH and the other main stakeholders, PQ and CHANCE. In the next step, the concrete measures were elaborated in cooperation with further stakeholders (see Table 4), also using input from the inhabitants' survey.

4.5. Process of Cooperation

At the start of the project, a core group was established that consisted of two people from the research and sustainability unit SRH, a person from SRH who was hired as the local project manager to be present in Osdorfer Born, and three people from PQ (one from the PQ headquarters and two working in Osdorfer Born and who received additional funding from the project). PQ served as a contact to CHANCE (persons working in the lodges) and to the local SAGA office (See Table 4).

During the project, three workshops were held with the main stakeholders: one at the start to define measures and activities (see Table 3), one at mid-term to evaluate the progress, and one at the end to evaluate the project and its measures. Between these workshops, regular meetings with the core group of stakeholders were held to monitor the process of the measures. To gather broad input from citizens, a survey among inhabitants was conducted as a starting activity. In total, 354 residents were contacted, of whom 114 were interviewed at the door of their flat by employees of SRH with a semi-structured questionnaire. The survey had two aims: first, to generate citizens' interest in the subjects of waste and cleanliness and in future activities; and second, to learn from their experiences and understand which topics citizens want to be handled, to learn about their waste separation behavior, and to learn about their attitudes towards waste topics. Table 5 gives examples from the unpublished survey and how it contributed to the development of measures.

Table 5. SRH survey with inhabitants: Overview on outcomes with focus on organic waste and respective measures developed.

Question Category	Summarized Answers	Respective Measure Developed
What types of waste are generally separated at home?	Organic waste 19%, recyclables 46%, paper 87%	Measure 4: improving waste separation behavior, reaching different target groups
What would have to change to enable or facilitate the separate collection of organic waste?	Free bins and collection bags 9%, neighbors need to participate 8%, more information 9%, more space for separation bins in flat 7%, better labeling of tons 4%	Measure 1 Improving waste locations sites; Measure 3 Lodges as information points, distribution of free bins

5. The Main Measures and Activities of the Project—Description and Results

In this section, based on the empirical studies (document analysis, observation, interviews), the main measures in the WiedergeBORN project are presented, including the problem definition, the development and conduction of activities, and the evaluation of the measure.

During the co-creative process at the beginning of the project, the key stakeholders decided to conduct the following main activities. Each main activity was then further developed, divided into sub-activities, and additional stakeholders were involved (see Table 4).

Measure 1—Improving Waste Storage Locations: Site visits, workshops, and direct observations at the beginning of the project revealed that the neighborhood's waste storage areas faced significant issues. These included poor accessibility for people with disabilities, inadequate placement of bins, and an unclean environment that discouraged residents from using the sites properly. The organic waste bins were too small, difficult to reach, and placed in inconvenient areas. Additionally, labels on the bins were too small, not self-explanatory, and not accessible to all residents despite translation into multiple languages. As a result, many residents had difficulty understanding the waste separation requirements, leading to improper waste disposal.

In response, a set of physical improvements was implemented. These included constructing new, accessible structures at waste storage sites, providing larger and cleaner bins, and introducing more intuitive labeling that included larger pictograms in place of text. The new labels were designed to convey sorting instructions visually, minimizing language barriers. The project also adjusted bin sizes based on waste type, with larger bins for organic waste placed in easily accessible spots. Three main partners collaborated on these interventions: SAGA, the property owner responsible for providing appropriate waste storage locations (according to German law, waste must be stored on private property and the owner must provide a location where the bins are placed that is adequate and accessible) [38]; a service provider contracted by SAGA to maintain the cleanliness and order of bins; and SRH, which supplied bins and managed their regular emptying. Through close collaboration, SAGA undertook necessary construction, SRH provided improved bins and labels, and enhanced communication was established between SRH and the service provider to address issues like littering and vandalism more effectively.

The evaluation workshop indicated a positive reception from residents, caretakers, and visitors, who reported improved cleanliness and accessibility. Measurable improvements included an increase in organic waste volume collected and a decrease in incorrect waste sorting, both essential goals for SRH. According to stakeholders, a key success factor was the improved physical environment of the waste storage areas, which facilitated easier, more appealing, and more accessible use by residents. This change was seen as a foundation for fostering sustainable behavioral shifts among residents, as an accessible and well-maintained environment was more likely to encourage proper waste disposal practices. Furthermore, improved cooperation between service providers, SRH, and CHANCE, a local neighborhood support organization, allowed for a quicker response to issues such as vandalism and improper bin usage.

Measure 2—Cleanliness in the neighborhood: SAGA highlighted a lack of cleanliness, which could be observed, and subsequently, the causes of littering were further analyzed and discussed in the co-creative process. The littering comprised minor issues such as papers and cigarettes disposed of in public spaces and littering on a larger scale, namely the illegal dumping of bulky waste items. Several causes for the bulky waste problem were identified, including a lack of knowledge, "inhabitants do not know how and where to dispose of bulky waste", and the cost, as the collection and disposal of bulky waste must be paid individually by households and many inhabitants regard the fees as too high. As an alternative, the inhabitants can bring their bulky waste to a recycling center free of charge, but, although the closest recycling center is in only 1 km away from Osdorfer Born, according to PQ the transport is still problematic as many households in the large housing estate do not own a car. As a consequence, bulky waste was often left in front of

the house. Bulky waste that is dumped illegally in the area must be collected by SRH in so-called 'sprint collections,' for which a fee is charged to SAGA and, therefore, is paid by all inhabitants. SAGA stated that the lack of cleanliness and littering are major concerns expressed by their tenants.

To improve the cleanliness in the neighborhood, more attractive public waste bins (colorful and "monster" bins to attract interest, especially of children) were provided. A more complex cooperation was needed to reduce the bulky waste problem. Before the project started, SAGA had already designated a garage where inhabitants could bring bulky waste. This offer was expanded by installing a container for bulky waste in front of another large building. The inhabitants could use the waste storage by contacting the concierges at the CHANCE lodges, who then could open the container or garage so that the bulky waste could be put in. A small vehicle was offered to assist with the transport from the apartments. When the container or garage was full, CHANCE informed SRH to collect the bulky waste and transport it to the recycling center. There, the usable bulky waste could be sorted as usual and brought to Stilbruch second-hand shops.

During the evaluation workshop and the interviews, the new colorful public waste bins were assessed positively, and minor littering visibly decreased. However, a need for more educational work on how to use the bins was expressed. The bulky waste measure was also regarded as successful. Illegal dumping of bulky household waste items in the area was significantly reduced, which translated into a considerable reduction of costs for SAGA, as the collection from the container and garage could be better planned. Furthermore, the bulky waste could be separated into different sub-fractions (especially furniture and WEEE—waste from electrical and electronic equipment) and consequently was easier to re-use or recycle. Additionally, the amount of separately collected WEEE increased because inhabitants were informed that they should dispose of WEEE as bulky waste and not as residual waste.

Measure 3—Lodges as information and communication points: The experience of SRH, and the analyses prior to the project, highlighted the lack of knowledge of the inhabitants about waste and recycling topics and the necessity to better inform residents to change their behaviors. To tackle this problem, at the project start, SRH and SAGA decided to use the existing lodges of the residential buildings and to involve CHANCE and its concierge employees as information and contact points for the project. The concierge employees of CHANCE were involved at an early stage and expressed high interest in the project, as many of them regarded waste and the lack of cleanliness as major problems in the area. They were trained at the beginning of the project on how to address the topics of waste prevention, recycling, and cleanliness.

The concrete measures were counselling sessions held during the lodges' opening hours. While residents' attendance at these sessions was lower than expected, they offered a good opportunity to exchange ideas with other local project partners. Craft and games afternoons were offered to inform about reuse and repair, but they met low responses due to comparable offers available in the neighborhood. Additionally, themed swap meets were held, intended to encourage resource-sharing among residents; the toy swap was well-received, while the clothes swap met with less enthusiasm, likely due to other competing events. It became clear that a longer period of time would be required to establish the idea and offers for such swap meets in the neighborhood. In the interviews, SRH and PQ stated that inhabitants expressed that used things have a negative stigma. Informational exhibits and displays on different waste-related topics, including showing previously used furniture from Stilbruch second-hand shops, were designed to increase local residents' use of various offers, but only met moderate interest. Although the impact was not directly measurable, these activities were still seen as valuable, as they increased general awareness and offered food for thought to the residents.

The distribution 300 small organic waste bins (Biomüllis) to separate organic waste and 10,000 compostable bags to the residents, free of charge, was regarded as successful by SRH. This measure was based on the findings from the analysis prior to the project and

from the survey among residents that many households did not separate organic waste due, on one hand, to the lack of knowledge, but also to practical reasons like lack of space for several bins and the fear of a bad smell from organic waste. The small waste bins and the compostable bags could offer solutions to overcome these concerns.

The training on waste topics, which was offered by SRH to the CHANCE employees, was regarded as successful and enabled the CHANCE employees to serve as direct contact people and multipliers towards the residents. However, due to the COVID-19 pandemic, the trainings had to be reduced, and, also, the direct contact with the residents was limited.

Measure 4—Improving waste separation behavior: SRH regularly conducts studies on waste separation in different sample areas in Hamburg that examine the content of the different waste fraction bins to estimate correct or incorrect sorting of waste fractions. The latest study prior to the project showed that in Osdorfer Born, the separation practice is significantly worse than in other areas with different types of housing [32]. During the workshops, SRH employees confirmed that incorrect waste separation is a problem in Osdorfer Born (see Section 4.1). The amount of organic waste that is collected in the area was significantly lower than in other neighborhoods. SRH, in the past, hesitated to campaign for more organic waste collection in large housing estates like Osdorfer Born because SRH expected an increase of mis-filling/mis-disposal of non-organic waste into the organic waste bins. This corrupts the organic waste stream; thus, such impure organic waste cannot be further processed (in the organic waste treatment plant: fermentation, biogas production, composting of the rest material). Therefore, in the past, SRH preferred to collect less but pure organic waste.

To improve the waste separation behaviors of the inhabitants and to increase correct waste separation, several measures were developed and conducted. A four-week organic waste collection campaign was conducted to achieve a collection of qualitatively and quantitatively 'high-quality' organic waste through information and training of residents on the waste separation process. It included the distribution of 1100 free-of-charge organic waste bins for pre-sorting bins at home (Biomüllis) and flyers at an information stand in the neighborhood, join-in campaigns, and a raffle of attractive prizes. Circa 20% of the inhabitants in the focus area could be reached, with 254 visitors at the stand. An extra analysis of organic waste was conducted before and after the four-week campaign, with the results showing that the volume of organic waste had increased by 51%. The usage of compostable paper bags to dispose of organic waste increased to 70%, while the usage of plastic bags to dispose of organic waste was reduced from 53% to 18%. The most common contaminants in the organic waste were plastic bags and packaged food.

Further outreach measures included school workshops on plastic recycling with the non-profit company Precious Plastic Hamburg. According to the interviews with SRH and PQ, these workshops received good feedback from teachers and pupils and led to a sustainable change in behavior among pupils. SRH also conducted practical waste separation training in the parent-child center. The participants were interested in the topic. For SRH, it was a positive takeaway that different target groups can be reached through specific facilities in the neighborhood.

In the evaluation workshop, the measures were regarded as successful. It was stated that separation behavior had improved, but also that the residual waste bins still fill up very quickly and that there is potential for more separation. The stakeholders agreed that behavioral change would need time and requires continuous support in the neighborhood and repetition of the campaigns. Regarding the waste separation training and the school workshops, the importance of reaching different target groups via neighborhood facilities was stressed and the attempt to consider different levels of knowledge and the motivation of adults through their children were highlighted as positive outcomes.

Measure 5—WiedergeBORN Festival: A three-day neighborhood festival was conducted to address the themes of waste and sustainability in a playful, informative, and participatory way. The festival was organized in cooperation with various facilities like VHS, public library, initiatives like Precious Plastic, and the shopping center. It offered

services like waste avoidance workshops and repair cafés, a puppet theatre on recycling, and games and challenges with prices. In total, 500 visitors across different age groups could be reached.

The festival was evaluated positively, as it reached many inhabitants who were not very familiar with the topics of waste and sustainability. Through the offers for children, their parents and relatives could be reached, and further participants could be targeted and mobilized via local stakeholders. The festival was regarded as a means to spread knowledge on the topic and to create a certain expertise among the citizens. It was important that the festival allowed dialogue with citizens rather than only one-way information. This enabled a further understanding of the views of inhabitants on waste and sustainability problems.

It can be stated that most of the measures were successful, and some still have a positive impact in the neighborhood. In contrast, the desired knowledge transfer of the lessons learnt from the project into the participating stakeholders' organizations and to other neighborhoods could not be implemented as desired by the core team of the project. Table 6 gives an overview on the measures and their innovative aspects compared to normal measures in this or other areas

Table 6. Measures and innovations introduced compared to other urban areas.

Measure Description	Innovative Aspects of Measure	Normal Measures in This or Other Areas
1—Improving Waste Storage Locations: physical improvements, accessibility, labelling, management of sites.	Measures developed in cooperation of different stakeholders (property owner, waste management, service provider).	Property owners provide standard waste storage locations, waste management company provides standard bins and labeling, not adapted to specific needs in areas. Limited cooperation between stakeholder
2—Cleanliness in the neighborhood: improved offers for bulky waste collection, and measures to improve cleanliness	Cooperation of concierge service of the property owner with waste management company; locally adapted measures against littering	Households are individually responsible for bulky waste disposal, no support from property owner; standard paper bins not addressing individual neighborhood
3—Lodges as information and communication points	Involvement of existing concierge employees, training as contact persons for waste and circularity topics	Concierge services normally are less interactive with inhabitants and other stakeholders. They are not responsible for circularity topics
4—Improving waste separation behavior	Four-week information campaign in the area as cooperation between various stakeholders. Educational workshops with different target groups (children, pupils, adults)	Normal waste separation behavior campaigns use classic media (posters, adverts) and address the citizens in general. Stakeholders like schools and childcare centers are less involved
5—WiedergeBORN Festival	Three-day neighborhood festival on waste and sustainability, organized with various local stakeholders	The topics waste and sustainability normally are addressed in classic information campaigns, not in neighborhood festivals

6. Discussion—Accounting of the Success and Failure Factors

As was described in Section 5, the stakeholders considered the project itself and most of its measures to be successful; however, the transfer of the lessons learned from the project was regarded as limited. To understand why, in this section, a categorization and discussion of the success and failure factors of the experimental project and its potential for transfer on a strategic planning level are conducted using the four pillars of accountability [11,27] as the analytical framework (see Section 2).

6.1. Responsibility: Success and Failure Factors

The guiding questions in the pillar 'responsibility' are: Which stakeholders (agents) were responsible to the citizens (principal)? Who was responsible for which actions? What were the responsibilities of stakeholders in regard to the actions monitored and in which form? As WiedergeBORN was an experimental strategic project involving several public, private, and civic stakeholders, the responsibility relations among these actors were also considered.

The main stakeholders of the project, SAGA, together with CHANCE, PQ, and SRH, are, as public actors, in general directly responsible to the government and the parliament of the City of Hamburg, and indirectly responsible to the citizens of Hamburg. Their specific main responsibilities are linked to their defined tasks and objectives, which are defined on a political level. In the case of SAGA, these are the offer of affordable housing and to care for the needs of its tenants. For SRH, the main tasks are waste management and cleanliness services in Hamburg (see Section 4.3).

According to the interviews, during the starting phase of the project, the responsibilities of the different public actors (SRH, SAGA with CHANCE and PQ) were not always clearly defined between the actors. As an example, the shared responsibilities for the waste storage locations (see measure 1) were mentioned in the interviews. SAGA owns the locations and is responsible for their construction and maintenance, but a sub-contractor is in charge of the cleanliness of the area. CHANCE can only collect complaints from inhabitants and is not allowed to intervene. Further, SRH owns the bins and oversees their contents and emptying them. The explanation and clear definition of the responsibilities, including the mandatory tasks and the objectives of the public actors, enabled the development of common goals for the project: to improve circularity in the area with a focus on waste management and cleanliness by developing and implementing place-based solutions with citizens and various stakeholders.

In the next step, the goals could be operationalized into measures to reach the agreed objectives. This would enable the joint development of new measures as well as the combination of different (existing) actions that normally would each have been under the responsibility of different actors (see five measures). The responsibilities for the implementation were clarified for both the new and the newly combined actions, which enabled their successful realization. In the interviews, the combination of actions was stated to have enabled synergies and made the project, as a whole, more effective and efficient. As described in Sections 4 and 5, many actions involved further public, private, and civic stakeholders. Again, the responsibilities and objectives of the different stakeholders were defined and then communicated between each other and the citizens, which supported the successful implementation of these actions.

The project enabled a clearer communication with the citizens regarding the responsibilities of each of the public stakeholders and the objectives of the project to improve waste management and cleanliness. This was possible through various information campaigns, exchanges, and direct contact because of the project's presence in the area and the way citizens were approached with different methods and by different actors.

In the interviews, it was stated that to successfully implement actions, it was good to combine the thematic responsibilities of the different public and other stakeholders and to commonly address the citizens in the area. This thematic and spatial focus was regarded as a key success factor, especially compared to customary actions of the different stakeholders that often are isolated and not adapted to specific spatial conditions. This corresponds with the findings of Williams [23] and Prendeville et al. [21], which show that, in order to achieve circularity objectives, spatially adapted solutions should involve stakeholders in their development and implementation and shared responsibility with citizens.

Continuation and transfer beyond the project: A major failure factor for the continuation of the activities of the project was, as stated by the interviewees, the lack of clear responsibilities beyond the project lifetime in Osdorfer Born. The different actors (CHANCE, SRH, PQ) continued some of the actions, but, with the closure of the project, the position of the local project manager also ended, and, therefore, a central responsible person was missing. Some of the lessons learned could be integrated into the work of the stakeholders and have been taken up as tasks in the respective units inside of the organizations: SAGA continues to use the developed recommendations for restructuring its waste storage locations; CHANCE was interested in using the training guideline for its lodge employees, but has not yet implemented a follow-up; SRH is implementing the

concept of a local caretaker, but in an adapted way; and PQ is integrating the topic of circularity more in its work in other neighborhoods.

A negative aspect that was mentioned regarding the legacy of the project was the limited or missing involvement of higher tiers of the administration on the district level (integrated urban district development, climate mitigation) and the city level (Ministry for Urban Development and Housing, Ministry for the Environment, Climate, Energy, and Agriculture). As a consequence, a responsibility gap occurred at the end of the project. This is a major hinderance for the transferring of the project's lessons learned on a strategic level, due to missed potential for up-take into policy, as described by von Wirth et al. [9] and Bulkeley et al. [10].

6.2. Transparency: Success and Failure Factors

The guiding questions regarding transparency are: How transparent was the strategic project to stakeholders and citizens? Who among the stakeholders (agents) is communicating with citizens in general and with different target groups? What kind of information is offered to citizens, and in which forms and formats is information presented [11,27]?

In the interviews, the sharing of knowledge and information and making it understandable and transparent among the project partners was seen as a main positive factor. This was possible because of the close cooperation and trust-building between the partners during the project.

Information on the aims and activities of the project and on its effects on improved waste management and cleanliness were communicated to the inhabitants in a clear and transparent way by the project partners. The citizens were reached by using different channels to address diverse target groups (see measure 4 on waste separation behavior). The cooperation of the partners enabled the bundling of information towards citizens. This proved to be more efficient compared to the normally separated communication by each of the different public actors. The inhabitants could be better reached because the information was specific to the project and adapted to the citizens in the area. This was regarded as an important success factor for the project, as SRH conducts generalized information campaigns for the whole City of Hamburg and consequently does not reach specific target groups, while SAGA and PQ communicate with local inhabitants, but normally not about the topics of waste management, CE, or sustainability in general. This efficient form of communication with the inhabitants was regarded as important to involve citizens (see Section 6.4 participation) and change their behaviors over a longer term.

The idea to involve the CHANCE employees at the lodges to train them as direct contact persons to communicate with the inhabitants on the project and its topics was regarded as very successful. The CHANCE employees were considered as easily accessible for the inhabitants and were enabled to transmit information to them. However, because of COVID-19, some of the communication activities, especially in and with the CHANCE lodges, could not be fully implemented, and the training of the CHANCE employees had to be limited.

Continuation and transfer beyond the project: As a shortcoming, the interviewees highlighted that continuous communication with the citizens and a repetition of information on waste management, cleanliness, and circularity would be necessary: first, because new inhabitants need to be informed, and, second, because the information needs to be refreshed over time. With the end of the project, the communication efforts could not be continued with the same intensity.

6.3. Assessment: Success and Failure Factors

The guiding questions in the pillar assessment are how the measures and their outcomes are evaluated. Which data are collected, by whom, and with which methods, and how are the data evaluated?

The analyses of the socio-spatial situation of the project area and its inhabitants that were conducted before the start of the project were regarded as important for understanding

the specific local problems and as crucial for the successful development and implementation of the measures that were adapted to the local situation. At the start of the project, the analysis of the regular waste separation assessment of SRH, which is normally used only internally, was shared and openly discussed with the other stakeholders. This was an important starting point for understanding the local problems and defining objectives and then measures in the project.

The assessment of waste separation (see measure 4) that was specially developed for the project and conducted before and after the waste separation awareness campaign made it possible for the project team to evaluate the effects of the measures immediately. Therefore, the significant improvement in organic waste separation due to the measures could be communicated to the citizens, which, according to SRH, had an additional motivation effect towards the inhabitants.

The survey among inhabitants (see Section 4.5) was seen as an important source of information to assess the status quo situation. Compared to the standard surveys that SRH conducts, this survey was regarded as more interactive and polled for deeper information about the behavior and attitude of the inhabitants on waste and circularity and on their personal perception of problems with waste management.

Overall, the intensive participation of the citizens in the project led to diverse and useful feedback from citizens on activities and outcomes of the measures and, according to the interviews, enabled a continuous assessment and consequent adaption of the actions.

The assessment of further measures (less bulky waste, increased re-use and recycling of bulky waste, improved cleanliness in the waste storage locations, less littering in public spaces) was primarily used for feedback among the stakeholders. In the interviews, it was highlighted that the positive results of the assessment were communicated internally to the management levels of SRH and SAGA. Based on the positively assessed measures, the members of the core group of the project could develop guidelines for the replication of some of the measures: the renovation and restructuring of the waste storage locations; the involvement of CHANCE lodges; and the involvement of day-care centers and schools.

Continuation and transfer beyond the project: A long-term assessment of the outcomes of the measures was not conducted after the project ended. According to the interviews, this information is necessary to evaluate the effects of the measures and the whole project, and it was suggested that a further assessment should be conducted a few years later. Furthermore, it was stated that a general evaluation of the project after its closure was missing. This was regarded as a hindering factor for the transfer of the project's learnings and the ability to integrate them in the strategies of the participating key stakeholders as well as on district and city level. Such a general evaluation serves to formalize learnings and experiences and permits an additional reflexive exchange among stakeholders [5,22,23].

6.4. Participation: Success and Failure Factors

In the fourth pillar, "participation", the involvement of citizens in the strategic project and of stakeholders in the decision-making process is examined. Guiding questions are: How are citizens and different groups involved? How are different stakeholders involved in the project? How are decisions made between different stakeholders?

As a main positive outcome of the project regarding participation, the direct and intensive contact with inhabitants via different channels was highlighted in the interviews. Through the bundling of activities and the cooperation between different stakeholders, many citizens who, according to SRH and PQ, normally are not interested in CE and waste management could be reached and directly engaged. Additionally, the cooperation with local experts and initiatives (see Table 4), who are closer to the inhabitants and have knowledge of how to approach and reach different groups of citizens, was also regarded as supportive when seeking to reach different groups of inhabitants. The intensive involvement of different groups of citizens enabled a more specific and better understanding of the local circumstances. As a consequence, the measures could be developed and implemented according to the problems and needs of different groups of inhabitants (e.g., considering

language barriers and using children as multipliers in families). The combination of the activities of the different stakeholders to involve citizens was regarded as a success factor. This was only possible because of the project's strategic approach, as normally each of the stakeholders would approach citizens separately.

Some of the projects involving citizens were regarded as particularly successful. The waste separation contest with inhabitants in two streets enabled citizens to gain direct insight into the content of their waste bins and immediately learn about correct waste separation (see measure 4). The presence of the local project manager and of the CHANCE lodges as direct contact points were also considered as positive factors that lowered the barrier for citizens to get involved in the different activities.

Continuation and transfer beyond the project: The employees of CHANCE were trained as multipliers to involve citizens during the project, but the training had to be reduced due to the COVID-19 pandemic. This hindered the stabilization of the work of the CHANCE employees. Nevertheless, according to the interviews, the CHANCE lodges served as information points for the inhabitants beyond the project's lifetime, but without offering specific activities. The negative aspects mentioned in the interviews were that, despite the intensive involvement of citizens, it needs to be critically observed how far the situation (waste separation behavior, cleanliness) could be improved in the long term. Limiting factors were that not all citizens could be reached and that many inhabitants are facing other problems, such as financial or social issues, and therefore waste or recycling are not the main concerns.

Table 7 provides a summary of the success and failure factors in the project respectively beyond the project and assigns them to the four pillars of accountability.

Table 7. Summary of success and failure factures in the project and beyond the project.

Pillars of Accountability	Success and Failure Factors in Project	Beyond the Project
1—Responsibility	Understanding of responsibilities of stakeholders enabled development of common objectives, and consequently of integrated measures. Responsibilities of different stakeholders were made transparent towards citizens which facilitated their involvement.	Responsibility beyond the project was unclear which hindered continuation of activities and transfer.
2—Transparency	Sharing information and trust building between stakeholders supported their cooperation. This enabled integrated communication with citizens adapted to target groups.	Communication with citizens could not be continued in the same intensity.
3—Assessment	Special analysis of data and survey enabled the development of locally adapted solutions. Assessment of measures could be used to develop guidelines for future transfer.	Assessment of measures ended with the project. The experimental project itself was not evaluated.
4—Participation	Citizens and local stakeholders were involved with targeted activities. The bundling and connection of activities and the cooperation with local multipliers enabled them to reach more citizens.	The training of local multipliers had to be reduced due to COVID-19. This limited their work beyond the project.

7. Conclusions and Outlook

Regarding integrating CE into strategic urban planning, the lessons learned from the experimental project WiedergeBORN need to be regarded on the project level and beyond.

Considering the project level, based on the evaluation conducted in this study, I find that the strategic approach of the project can be rated as successful. The project was set-up

based on an analysis of the situation (socio-economic, spatial). Subsequently, a cooperation between the main public stakeholders who are active in the area could be established. This enabled a common definition of objectives—in accordance with the sustainability strategies of the different stakeholders—to be reached with the project. Based on these objectives, measures and activities were developed and implemented. Further stakeholders from the public, private, and civic sectors were involved, which supported the successful implementation of most of the planned actions. The intensive exchange between the stakeholders enabled a collaborative learning process during the project. This was possible due to the exceptional situation of the project that gave the stakeholders a mandate to cooperate and act beyond their ordinary tasks. From a spatial development perspective, the concentration in a neighborhood proved to be key for the success of the measures because it enabled the bundling of activities in a functional area. The combination of social and educational measures that envisaged a behavioral change with physical measures that improved the built environment proved to be successful. This underlines the necessity of a socio-spatial approach. Another spatial aspect was the ability to overcome administrative micro-boundaries between involved stakeholders due to the cooperative project design.

Beyond the project, both in terms of timing and organizational levels, the legacy of the project was limited. Reasons can be found in the extraordinary project situation, which enabled extra funding notably to finance a project manager in the area. With the end of the project, the funding of the managing position ended, and with it the intensive exchange between stakeholders and the bundling of activities. Furthermore, all representatives of the key stakeholders had a mandate to work on the project. This enabled opportunities and the freedom to try things out as part of the project and collaboration between the stakeholders over short distances. With the end of the project, the work of the individual actors resumed according to the customary practice. Moreover, only a limited transfer of learnings from the working level to the decision-making level with the involved organizations, SRH and SAGA, was achieved. Consequently, SRH and SAGA/CHANCE only transferred the project results to a limited level into their strategies (sustainability strategies of SAGA, SRH, local development plans) and future work. Another shortcoming was the lack of involvement of strategic levels in the district and the city. Lastly, there was a lack of a strategy to maintain the legacy of the project. Such a strategy could enable the sustainability of project outcomes and enable transfer and replication of the results of the project.

I propose several recommendations for future projects that center place-based approaches to develop and implement solutions to improve waste management and circularity in collaboration with the relevant stakeholders and with local citizens.

One success factor was the local project manager, who enabled cooperation with stakeholders in the area and with citizens. This role is not transferable one-to-one in all cases, but its tasks could be integrated into the work of existing 'caretakers' like neighborhood or climate action managers and other intermediaries working at the interface with citizens.

The strategic approach led to accountable results whose measurable outcomes gained the interest of stakeholders. This could support replication in other projects, as the communication of tangible results is important both to citizens and within the organizations of stakeholders and to decision-makers [9,11].

The integration of environmental, social, and educational aspects in the measures and the cooperation with actors from these fields led to positive outcomes. For future projects on circularity, the involvement of actors representing social services and education can be recommended. This could be supported through strategies and programs that interlink different policy fields (e.g., local development plans).

The project placed citizens at the center of its objectives and measures, and it developed and implemented solutions with them. Furthermore, it directly impacted their wellbeing, improving cleanliness and the living environment through circularity objectives. This could be adopted by other projects to involve citizens in the sense of just transformation.

Another recommendation for future projects is to develop a plan for the legacy of the project and to better integrate higher decision-making levels from an early stage. This could support the integration of lessons learned into strategies of the participating stakeholders.

Lastly, comparable projects will need enabling framework conditions. A simple replication of a project like WiedergeBORN might cause unnecessarily high efforts and costs. To provide projects with funding and an organizational frame, circular economy aspects could be integrated into existing programs, e.g., social development programs (like RISE in Hamburg), local climate action plans, and urban development plans. These plans should consequently be adapted and used for future projects to enable the integration of social and environmental aspects to realize circularity [46,47]. An alternative could be the development of specific strategies on circularity, which for their part need to consider existing social, environmental, and spatial development strategies [5,22,23].

From a methodological perspective, the usage of accountability as a framework enabled a structured analysis of the project, especially regarding the relationship between the principal (citizens) and the agents (public actors), and in this case also between the different public actors. The four pillars of accountability are a basis for a practicable guideline to deconstruct a project in order to understand its potential contribution to strategic planning. However, in this case study, the four categories were partly overlapping and could not be always easily separated from each other.

To better understand the potential of experimental projects that establish CE and how they are or could be linked to strategic urban planning, an in-depth investigation of further examples would be required. An analysis of several experiments could then enable a comparative approach of a larger variety of cases.

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