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Journal of Environmental Management and Tourism

Journal of Environmental Management and Tourism is an open access, peer-reviewed interdisciplinary research journal, aimed to publish articles and original research papers that contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences. The Journal publishes original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modelling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies.

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How Advanced Is Green Participatory Budgeting in Poland and Spain? A Case Study of Gdansk and Barcelona

Małgorzata SIEMIONEK-RUSKAŃ
Department of Banking and Finance
Faculty of Management
University of Gdansk, Poland
ORCID: 0000-0002-0733-456X
malgorzata.ruskan@ug.edu.pl

Anna SIEMIONEK-LEPCZYŃSKA
Department of Corporate Finance
Faculty of Management
University of Gdansk, Poland
ORCID: 0000-0003-0303-7477
anna.siemionek@ug.edu.pl

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Abstract: This study explores the advancements in Green Participatory Budgeting (GPB) in Poland and Spain, focusing on case studies from Gdansk and Barcelona. GPB integrates participatory budgeting with environmental sustainability, enabling citizens to influence the allocation of municipal funds toward projects that enhance both environmental and social welfare. The research analyzes the implementation, outcomes, and challenges associated with GPB in the two cities. Spain, particularly Barcelona, has seen widespread adoption of participatory budgeting, providing valuable insights into its impact and effectiveness. The paper discusses the historical context, the evolution of participatory budgeting in these regions, and the specific green projects funded. It also highlights the environmental and social benefits, such as increased urban green spaces and enhanced community engagement, as well as the difficulties faced in achieving consensus and managing the complexities of the application process. By comparing these two cities, the study aims to shed light on the broader implications of GPB and its potential as a tool for sustainable urban development.

Purpose: This study explores the advancements in Green Participatory Budgeting (GPB) in Poland and Spain, with a focus on the cities of Gdansk and Barcelona. The goal is to analyze the implementation outcomes and challenges associated with GPB, highlighting its impact on environmental and social welfare.

Design/Methodology/Approach: The research employs a case study approach, examining GPB practices in Gdansk and Barcelona. Data were collected through document analysis, interviews, and direct observations conducted during the spring and summer of 2024. The study investigates the historical context, evolution, and specific green projects funded under GPB in these cities.

Findings: The study reveals that Barcelona has seen widespread adoption of participatory budgeting, providing valuable insights into its effectiveness and impact. In both Gdansk and Barcelona, GPB has led to increased urban green spaces, enhanced community engagement, and significant environmental and social benefits. However, challenges such as achieving consensus and managing the complexities of the application process persist.

Practical Implications: The findings suggest that GPB can be an effective tool for sustainable urban development, provided that local governments address the challenges associated with its implementation. The study offers practical recommendations for improving GPB processes, including enhanced civic education, streamlined application procedures, and continuous public outreach.

Originality: This paper contributes to the understanding of GPB by comparing its implementation in two different European contexts. It provides a comprehensive analysis of GPB's potential and challenges, offering insights that can guide policymakers and practitioners in other cities considering similar initiatives.

Keywords: green participatory budget; participatory budget; case study; Poland; Spain.

JEL Classification: H72; Q56; R58.

Introduction

Green Participatory Budgeting (GPB) merges participatory budgeting with environmental sustainability, allowing citizens to decide on projects that enhance environmental and social welfare. This study examines GPB practices in Gdansk, Poland, and Barcelona, Spain, focusing on their implementation, outcomes, and challenges.

In the European context, Spain was the country where participatory budgeting spread the most (Sintomer *et al.* 2008; Sintomer and Ganuza, 2011). There, we analyzed, up until 2010, over fifty experiments implemented that, in one way or the other, provided almost five million people the opportunity to participate, although we must consider the criteria used to consider any experiment as a participatory budget. The experiments started in 2001 in three Andalusia municipalities (Cabezas de San Juan, in Seville, Cordoba and Puente Genil, in Cordoba province). In 2002, Rubí, in the province of Barcelona, and Albacete have also initiated the process. The 2003 local elections have boosted the implementation of new experiments. Up until the end of 2006, right before the elections of the following year, over twenty-five municipalities had started the process. Two of them (Cabezas de San Juan and Rubí) had abandoned the experiment with the change of government following the local election of 2003. After the 2007 elections, participatory budgeting had a new impulse, which leded it to its largest presence in Spanish municipalities. By then, the difference lay in the fact that conservative parties started to implement similar experiments (Ganuza, Francés 2014, 302).

For the first time, participatory budgeting schemes began to appear in large cities such as Madrid, Valencia, Zaragoza, and Barcelona (the four largest cities in the country, comprising around 20% of the Spanish population) (Francisco, Carratalá, Ganuza 2018, 278.)

1. Literature Review

Participatory budget is based on public co-governance. It is a kind of bottom-up process that involves the activation of residents to actively participate in decisions regarding the spending of a portion of the funds financed from the budget of a given local government unit on previously submitted projects (Owsiak 2017). It is a process of decision-making in a democratic manner by the people living in a municipality that implements a participatory budget. Decisions made in this way, show how money from the municipal budget is to be spent (Burchard – Dziubińska. 2016). Participatory budget can be also understood as a separate part of the local government budget under which a specified amount of spendings is allocated to initiatives and investment projects directly proposed by the local communities. The idea of a participatory budget is part of the concept of civil society and public governance (<https://www.sejm.gov.pl/sejm10.nsf/BASLeksykon.xsp?id=667DCF4F24778F74C1257A710030C2E9andliteraB>).

In the world, the first participatory budget was introduced back in 1989 in Porto Alegre, Brazil. The event followed the end of the military dictatorship in the country. Such activity was intended to establish a new kind of governance, involving public discussion, and lowering the level of incidence of inequality among the residents of Porto Alegre. The idea of public consultations became very popular all over the world (Sintomer, 2008)

Participatory budgeting facilitates not only the daily life of the inhabitants, but also for local, authorities, which, thanks to citizen engagement initiatives, can find out what are the most important needs of the inhabitants of a given territory and the development of which areas of life are most important to them (Krześ, 2016).

Green participatory budget has both advantages and disadvantages. One of the main benefits indicated by the cities which implemented Participatory budgets is a more effective way of public expenditures. This results on the one side in an increased responsiveness to expressed public needs, on the other side there is an incorporation of residents' pioneering spending ideas (<https://www.participatorybudgeting.org/about-pb>). Furthermore, the following advantages were indicated:

- citizens have direct influence on decisions on public investments in their local communities,
- better understanding of residents' concerns by the local authorities,
- it can also help to improve relations between residents and local authorities,
- more transparent and accountable relationships with local authorities,
- as an opportunity for youth to gain confidence, communication skills, and experience in leading participatory budget projects.

On the contrary, the following disadvantages were mentioned:

- some leaders may use the Green PB for their own purposes,
- complicated application procedure with numerous documents,
- it may be difficult to reach consensus among residents on what public funds should be used for.

Despite its many benefits, green participatory budgets also pose some challenges for local governments, such as the need for civic education, ensuring broad and equal access to the process, or the risk of popular projects dominating at the expense of those that are more needed but less attractive. It is important that the system of PB

be constantly improved and adapted to the changing needs of residents and local conditions (<https://www.budzetobywatelski.pl/strefa-mieszkanca/jak-dzialaja-budzety-obywatelskie>).

The main effects of the implementation of participatory budgets in cities include higher quality of life, increased satisfaction with public services, greater transparency and credibility of local public authorities.

Within the framework of the participatory budget there is a so-called green participatory budget (GPB). Under this term are funds, allocated specifically for improving the natural appearance of a given city (<https://zpe.gov.pl/a/budzet-obywatelski/DXojz1pTD>).

Summary note prepared by OECD in 2022 answered three questions regarding participatory budgeting OECD, 2022):

- what is the typical scale and focus of Participatory Budgeting, and can or should its impact be strengthened?
- who participates in PB projects and why? Does it strengthen the democratic process, or the opposite?
- are there related approaches, e.g., through legislatures or referenda, that could be more effective?

The results showed that most of green PB projects are going on at the local level to allocate small-scale public funds mainly to capital investment projects. There is some evidence that green PB has led to increase the level of budget transparency and even efficiency of spending public funds. Green PB processes have evolved from in-person set-ups to hybrid or online set-ups. This type of solution was the result of pandemic and affected in broader participation but on the other side if local authorities rely on online-only this can lead to reduce the deliberative aspects. Sun-Moon Jung, in his research, indicated that PB can work for two different but interconnected needs: the quality of democracy (resource allocation and poverty alleviation) and government efficiency (fiscal sustainability and cost efficiency (OECD, 2022). Mechanisms for the application of participatory budgeting vary, adapting to the local context, and the percentage of the budget placed at the disposal of residents also varies.

Since 2007, a lot of transformations have taken place in the market for green finance, given the Paris Agreement of 2015 and the European Green Deal of 2019. Numerous areas of activity can be targeted by green finance, such as green industry, renewable energy, energy efficiency, distribution and storage, emission reduction, green building, and green transport (Siemonek-Ruskań, Lepczyński, Fanea-Ivanovici. 2022).

Projects submitted for voting in green participatory budgets should contribute to one of six environmental objectives indicated by European Union Taxonomy for Sustainable Finance namely (OECD.2021): climate change mitigation, climate change adaptation; sustainable use and protection of fresh water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems, without harming any of the other activities.

The Green Participatory Budget assumes the development of public, publicly accessible urban green areas through the construction of new green spaces and the renovation and modernization of the development of existing ones, in accordance with the current study of the conditions and directions of spatial development of the city and the provisions of local spatial development plans. This is in response to the needs of residents expressed in the form of submitted projects.

Green budgeting “offers a range of tools and techniques for governments seeking ways to bring green perspectives to bear on the budget process” (OECD, 2021). Many OECD countries have introduced green budgeting into their public financial management frameworks, policies, and practices to help pursue climate and environmental objectives. According to report prepared by OECD in 2022, 24 out of 36 OECD countries implemented green budgeting measures. This shows a significant increase in the number of countries involved in green budgeting where only 14 countries did it.

Starting from 2008 in Lisbon in Portugal many countries started e-budgeting in participatory budget as a form on innovation which involves the use of digital technology. Such solution has two main advantages: it increased the number of residents of cities to take part in voting of the public in budgetary decisions, on the other side it increased the level of knowledge of residents about investments financed from the city budget (OECD, 2016).

Kimic K., Polko conducted a study to pinpoint the expansion trends of the Katowice Green Budget based on editions from years 2020 to 2023. In the mentioned period citizens of Katowice proposed 715 green projects and 347 of them were selected for implementation. The authors found that there is a growing trend in the number of green projects in the first 3 editions and stabilization in the 4th edition. Project were related to the development of greenery as well as green education (Kimic K., Polko 2024).

Kociuba and Rabczewska (2019) analyzed the implementation of participatory budget and green participatory budget in Lublin in years 2015-2019. detailed analysis of the PB showed that 86% of investment projects submitted and 87% of projects selected for implementation were directly associated with activities in public

space. They also focused on describing main assumptions and models of participatory budgeting as well as the legal basis and rules of PB execution in Poland (Kociuba and Rabczewska 2019).

Falanga others (2023) investigated the emerging trends of citizen proposals, projects, votes, and public funding in participatory budget in city of Lisbon. The authors noticed the accomplishments of the Lisbon PB of city of Lisbon played a dominant role in urban sustainability. The trends of the achievements depend on the one side on residents' voice and on the other side on influence of policymakers from the City Council of Lisbon (Falanga, *et al.* 2023).

Kimic and Polko focused in their research on projects from participatory budget in Warsaw in Śródmieście district from the years 2015 to 2022. The results showed that more than half of selected projects were addressed to older adults. Among these projects, the urban greenery category accounted for 29.58%. This indicates the growing need for creation of projects suitable for older adults (Kimic, Polko 2023).

Nowak presented a proposal to separate a green budget in the participatory budget, due to the low, at about 13%, share of projects on green project in year 2013-2015. The author proposed activities that can be implemented within the framework of a participatory green budget in Olsztyn such as: informational meetings on the role and importance of greenery in the city, plant care, engaging residents to identify sites with devastated urban greenery and planting new trees and shrubs (Nowak 2017).

Maczka and others investigated 49 cases of participatory budgeting implementation in Western Poland, mainly in the Wielkopolska Province and the neighboring provinces. The authors pointed out that there is no one leading participatory model presented in the analyzed municipalities, but the two-model dominated: Porto Alegre and Consultation of Public Finance (Maczka *et al.* 2021). The Porto Alegre model is aimed at residents who have real power. According to Sintomer and others, the basic idea was "to allow non-elected citizens to have a role in the allocation of public money, with direct decision-making power at the local level, the power of co-decision at the city level, and oversight capacity at all levels" (Sintomer, *et al.* 2012). Consultation model (CF) is described also as a consultative type and is based on selective listening. Local authorities are responsible for control and monitoring activities (Maczka *et al.* 2021).

Klemens indicated that the pandemic has contributed to the reversal of the attitudes of city inhabitants towards using ICT tools and taking greater care of environmental issues in 2019-2021 in participatory budgets in Poland. The Author suggested creating participatory budget database with standardized categories. This would enable to make a comparative analysis with other cities. The other recommendation was to create green participatory budgets in each city in Poland (Klemens, 2022).

Wetoszka examined Poland and Germany PB. He confirmed in his research that "PBs in both countries have been mostly simple innovations of limited quality, but those in Poland tended to perform better, judged by the two chosen criteria PBs in both countries utilize their functionalities in diverse ways" (Wetoszka, 2022).

2. Method

This study employs a qualitative case study approach, focusing on the cities of Gdansk in Poland and Barcelona in Spain to explore the implementation, outcomes, and challenges of Green Participatory Budgeting (GPB). In-depth analysis was conducted in the year 2024. The case study method allows for a comprehensive and detailed examination of the GPB processes in two distinct urban contexts. This depth of analysis helps in understanding the complexities and nuances associated with GPB implementation. By selecting Gdansk and Barcelona, the study provides comparative insights into how different cultural, political, and administrative contexts influence the success and challenges of GPB. This comparative approach highlights the adaptability and variability of GPB practices.

3. Case Study

3.1 Gdansk

The participatory budget was first implemented in Poland in 2011 in Sopot. It quickly became one of the most popular local initiatives aimed at involving residents in the process of city management. The main goal of participatory budgeting is to create a common space by residents and local authorities.

In Poland in 2018, a new regulation was introduced for cities with county rights, the establishment of a participatory budget is mandatory, except that the amount of the participatory budget is at least 0.5% of the municipality's expenditures included in the last submitted budget execution report. (Ustawa 2018, art 5a).

Within the framework of the participatory budget, residents decide annually on the share of the municipality's budget expenditures in direct voting. Tasks selected as part of the participatory budget are included in the municipal budget resolution. The municipal council, in the process of drafting the budget resolution, cannot remove or

significantly change the tasks selected as part of the civic budget. Funds spent on the participatory budget may be divided into parts covering the whole municipality and its parts (Ustawa 2018).

Stages of green participatory budget in Poland are as follows (Najwyższa Izba Kontroli. 2019):

1. Determining the procedure and tasks of carrying out consultations on BP;
2. BP advertising campaign;
3. Accepting applications with BP project proposals;
4. Verification of submitted BP project proposals;
 - a. Possible rejection of applications that do not meet formal requirements
 - b. Any appeals against decisions to rejection of applications that do not meet formal requirements
5. Voting on selection of BP projects;
6. Execution of projects selected by BP voting;
7. BP evaluation.

The first voting under the participatory budget of the city of Gdansk took place in 2013. Green participatory budget was introduced in Gdansk in 2020 (<https://www.gdansk.pl/budzet-obywatelski/zielony-budzet>). Every resident has the right to submit a project. What is worth mentioning is also the fact that children can also vote in participatory budgets with help of their parents or legal guardians. In Gdansk funds disbursed under the participatory budget are divided into categories including district projects (80% of participatory budget) and city projects (20% of participatory budget). Green participatory budget projects are allocated 20% of funds for district projects of a given district and 30% of funds for all city projects.

The scope and impact of GBP in year 2024 was described in Table 1.

Table 1. The scope and impact of Green Participatory Budgeting in Gdansk in year 2024

Budget allocation		Green Project proposals on all city level and selection		Green Project proposals on district level and selection	
Total PB	20 441 573 PLN				
Percentage for all city green projects	20%	Total projects proposals submitted	1 140 000 PLN	Total projects proposals submitted	3 306 790 PLN
Percentage for district green projects	30%	Green project proposals submitted	12		84
		Green projects selected for implementation	5	Green projects selected for implementation	40

Source: Authors own research based on: <https://www.gdansk.pl/budzet-obywatelski>, access date 30.07.2024

In 2024, there were 12 GBP city projects (1 140 000 PLN), and 84 green district GBP projects (3 306 790 PLN) on the list to vote. Voting for BO projects took place in 2024 from September 11th to 25th with overall attendance on the level of 10,65%.

As in previous years, votes could be submitted via the city's portal www.gdansk.pl. Each voter is entitled to a total number of total 8 points: 5 points for PB district projects and 1 point for a citywide PB project, and 1 point for a GBP district project and 1 point for a GBP project. In voting there were 5 city GBP projects and 40 district projects selected. The selected city GBP projects are presented in Table 2.

Table 2. The list of selected city GBP projects in Gdansk for year 2024

Title of all -city GBP project	Cost
Gdansk saves old trees - South Edition	380 000 PLN
Green Oliva - project to restore tree canopies along Grunwaldzka Avenue	380 000 PLN
Paradise Gardens in Long Gardens	225 000 PLN
Guided nature walks in every district of Gdansk	22 000 PLN
Gdansk solar tree to charge mobile devices	380 000 PLN

Source: Authors research based on <https://www.gdansk.pl/budzet-obywatelski>

When taking into consideration 40 district GPP projects, which were chosen it is worth mentioning key areas regarding those projects such as: planting of new trees and shrubs, nesting boxes for birds, clean ponds, green parks, flower meadows, green relaxation zone by the stadium, removal of illegal garbage and waste dumps in Letnica district, water tanks in Przymorze district, hotels for insects and others.

On 17th of September 2024 City of Gdansk organized picnic full of numerous attractions promoting the PB voting. Everyone who cast a vote on the spot received a pot of heather. This is why the picnic slogan was “Heather for a vote”. Citizens had an opportunity to meet with representatives of different project which were on the list. The was also a possibility of voting via iPads on special stand with the help of city hall representatives. It could be noticed as an attractive method of promoting PB among especially older people who mostly need help with ICT services. – The main aim was to encourage residents during the picnic to participate in the PBP voting. There were also yellow ecological bags distributed among residents of Gdansk with logo of BP as a part of the advertising campaign.

In 2025, PLN 4,137,851 PLN (of the total BO amount) will be allocated for this purpose:

- all-city green projects - PLN 1,304,922;
- green district projects - PLN 3,718,649.

For the year 2025, in Gdansk, there is possibility of submitting projects for the Green Participatory Budget in five thematic areas such as: (<https://www.gdansk.pl/budzet-obywatelski/Co-to-jest-Zielony-Budzet-Obywatelski>, access date 25.07.2024)

1. Planting and maintenance of vegetation in urban green areas;
2. New green spaces;
3. Rain garden construction;
4. Renovation and modernization of the development of existing green areas;
5. Ecological activities.

3.2. Barcelona

In 2024, Barcelona has allocated a significant portion of its municipal budget to Green Participatory Budgeting (GPB) (<https://www.barcelona.cat/ca>).

To present the significant role of GPB in Table 3 and 4 will be presented numbers that highlight the scope and impact of these initiatives.

Table 3. The scope and impact of Green Participatory Budgeting in Barcelona in year 2024

Budget allocation		Green Project proposals on all city level and selection		Green Project proposals on district level and selection	
Total PB	€100 million				
Percentage for green projects	35%	Total projects proposals submitted	1500	Total projects proposals submitted	12 000 000 Euro
Percentage for district green projects	30%	Green project proposals submitted	525	Projects implemented	50
Total funds for green projects	35 000 000 Euro	Green projects selected for implementation	150	Key initiatives	15 new corridors, 20 new gardens, 15 park improvement projects

Source: authors own research based on: <https://www.barcelona.cat/ca> and <https://opendata-ajuntament.barcelona.cat>

There is an important impact of participatory budgeting on civic engagement in Barcelona. It examines how the process has fostered community involvement and assesses the effectiveness of participatory mechanisms (Subirats, Brugué, Parés 2023, 8-15). There are visible broader implications of participatory budgeting on urban governance in Barcelona and many case studies present successful green projects and their impacts on the city (Ferranti, Vericat, Konig, 2017)

Table 4. The scope and impact of Sustainable Transportation, Renewable Energy and Waste Reduction within Green Participatory Budgeting in Barcelona in year 2024

Sustainable Transportation		Renewable Energy		Waste Reduction	
Total Budget	€10 million	Total Budget	€8 million	Total Budget	€5 million
Projects Implemented	45	Projects Implemented	30	Projects Implemented	25
Key Initiatives	New bike lanes: 50 km	Key Initiatives	Installation of solar panels on public buildings: 25 installations	Key Initiatives	Introduction of new recycling points: 50 locations
	Secure bike parking facilities: 30 new locations		Subsidies for residential solar panels: 500 households supported		Expansion of composting facilities: 20 new sites
	Expansion of electric vehicle charging stations: 100 new stations		Energy efficiency upgrades in municipal buildings: 10 major upgrades		Public awareness campaigns on waste segregation: 5 major campaigns

Source: authors own research based on: <https://www.barcelona.cat/ca> and <https://opendata-ajuntament.barcelona.cat>

There are environmental benefits such as (Epting 2020):

- reduction in carbon emissions: 5% reduction city-wide,
- 15% increase in municipal renewable energy capacity.

Following social benefits can be noted:

- community garden plots created: 2,000 new plots,
- public parks enhanced: 100 hectares of parks improved.

Barcelona's Green Participatory Budgeting in 2024 demonstrates a robust commitment to sustainability and citizen engagement, with substantial investments in urban green spaces, sustainable transportation, renewable energy, and waste reduction. The significant participation and positive environmental and social impacts underscore the success of these initiatives, offering a valuable model for other cities worldwide.

4. Research Results

Gdansk has been practicing participatory budgeting since 2013. The process allows residents to propose and vote on local projects funded by a portion of the city's budget, promoting civic engagement and transparent governance.

Within the projects integration of green aspects can be observed. Gdansk has seen an increasing number of green projects within its PB framework. Examples include urban gardens, renewable energy installations, and initiatives aimed at improving air quality and promoting cycling. The city actively promotes the submission of green project proposals through workshops and public consultations, highlighting the importance of sustainability. A dedicated portion of the PB budget is often reserved for environmental projects, ensuring that green initiatives receive consistent support. Those projects should present both Environmental and social benefits. The funded projects have led to more green spaces, better waste management, and improved urban biodiversity. Community involvement in green projects has fostered a stronger sense of community and increased public awareness of environmental issues. On the other hand, there are issues that remain a challenge such as awareness and participation. Another fact which could be difficult would be to balance priorities such as allocating funds to green projects while addressing other community needs.

Barcelona's participatory budgeting process, initiated in 2016, involves citizens in the allocation of municipal funds, encouraging proposals and votes on community projects. The municipal budget in Barcelona for 2024 is 3,807 million euros, up 5.9% on the previous year. Integration of green aspects was the main advantage. Barcelona has implemented various green projects through its PB process, such as creating green corridors, improving public parks, promoting urban agriculture, and enhancing cycling infrastructure. The city conducts extensive campaigns and workshops to educate residents about the environmental impact and encourage green project proposals. A

significant portion of the PB budget is allocated to green projects, reflecting Barcelona's commitment to sustainability and climate action.

The conducted project has impact on citizens life. There are environmental benefits because projects have resulted in increased urban greenery, reduced carbon emissions, and greater public engagement in environmental issues. Social benefits could be also observed. The GPB process has strengthened community ties and increased civic participation in local governance.

In comparison to Gdansk there are other obstacles to overcome. Keeping residents engaged in the GPB process over the long term remains a challenge. Ensuring that selected projects are implemented efficiently and effectively can be hindered by bureaucratic and logistical issues.

Comparative analysis revealed following similarities: both Gdansk and Barcelona have successfully integrated green projects into their PB processes. Community education and involvement are crucial components in both cities. Both cities have observed environmental and social benefits, including improved green spaces and enhanced community cohesion.

There are also some differences regarding:

- scale and scope: Barcelona's PB process is larger in scale compared to Gdansk, with a greater budget and more extensive projects,
- funding allocation: Barcelona allocates a higher percentage of its PB funds to green projects compared to Gdansk,
- challenges: Gdansk faces more significant challenges in raising awareness and participation, while Barcelona struggles more with sustaining long-term engagement and efficient project implementation.

Both Gdansk and Barcelona have made significant progress in integrating green participatory budgeting into their municipal governance. Barcelona, with its larger scale and higher funding allocation, demonstrates a more extensive approach, whereas Gdansk shows steady progress and increasing community involvement. The experiences of these cities highlight the potential and challenges of GPB, offering valuable insights for other municipalities aiming to incorporate environmental sustainability into their budgeting processes.

5. Discussions

What was the reason to compare Gdansk with Barcelona? First, diverse Geographical and Cultural Contexts. Gdansk is located in the Northern Poland. Gdansk is a historic city with a strong maritime heritage. It has a population of approximately 470,000 and is known for its rich history and cultural significance in Poland. Barcelona, as the capital of Catalonia in Spain, Barcelona is a major global city with a population of around 1.6 million. It is renowned for its architecture, cultural vibrancy, and economic importance in Europe. Comparing a mid-sized Central European city with a major Southern European metropolis provides insights into how different geographical and cultural contexts influence the implementation and effectiveness of GPB.

There were observed different stages of participatory budgeting development. Gdansk introduced participatory budgeting in 2013 and has gradually integrated green aspects into its PB process. The city's experience reflects the early stages of developing and refining GPB. Barcelona implemented PB in 2016 and has quickly advanced in integrating green projects. The city's experience showcases a more mature stage of GPB with broader community engagement and larger-scale projects.

Poland's economic and political environment, characterized by its transition from a centrally planned economy to a market economy, influences Gdansk's approach to GPB. The city operates within a framework of increasing decentralization and democratization. Spain's economic and political environment, marked by a stronger tradition of regional autonomy and a well-established market economy, shapes Barcelona's GPB practices. The city's governance model includes a higher degree of local autonomy and a strong emphasis on civic engagement.

Comparing cities in different economic and political contexts allows for an understanding of how these factors impact the design and success of GPB initiatives. **There were also observed diverse approaches to environmental sustainability.** The focus in Gdansk has been on integrating smaller-scale green projects, such as urban gardens and improving air quality, reflecting the city's evolving approach to sustainability. Barcelona has implemented a wide range of large-scale green projects, including green corridors, urban agriculture, and extensive cycling infrastructure, demonstrating a comprehensive and ambitious approach to sustainability.

Both cities can learn from each other's experiences, challenges, and successes. Gdansk can benefit from Barcelona's advanced and comprehensive approach to GPB, while Barcelona can gain insights from Gdansk's community engagement strategies and incremental integration of green projects. Sharing best practices and

innovative solutions between these cities can foster improvements in GPB processes, leading to more effective and sustainable outcomes.

Conclusions and Further Research

Comparing the GPB practices of Gdansk and Barcelona offers valuable insights due to their diverse geographical, cultural, economic, and political contexts, as well as their different stages of PB development and approaches to environmental sustainability. This comparative analysis not only highlights the unique challenges and successes of each city but also provides a framework for other municipalities aiming to implement or enhance GPB initiatives. The potential for cross-learning and innovation makes this comparison particularly worthwhile, contributing to the broader discourse on sustainable urban development and participatory governance.

Credit Authorship Contribution Statement

Małgorzata Siemionek-Ruskań: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition;

Anna Siemionek-Lepczyńska: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition.

Declaration of Competing Interest

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

Declaration of use of generative AI and AI-Assisted Technologies

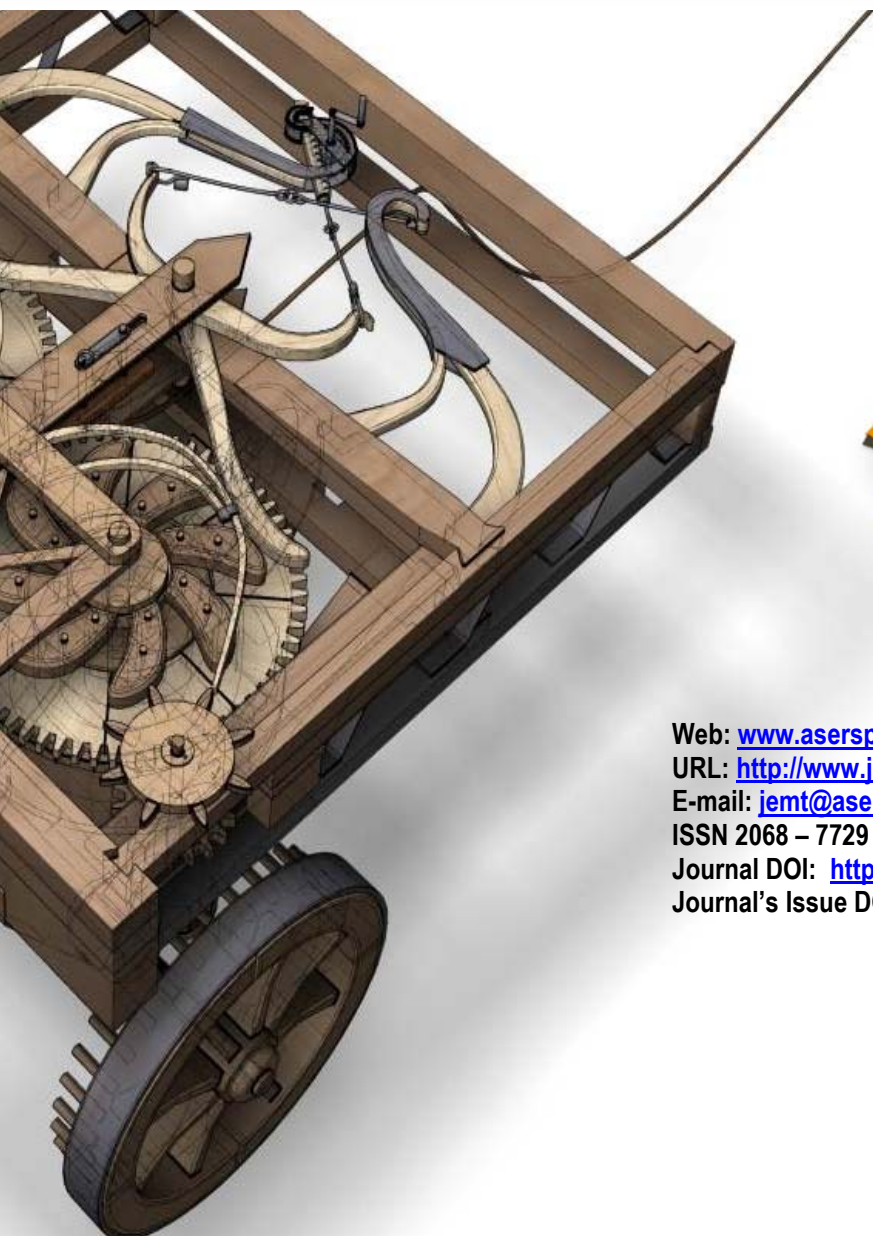
The author declares that she has not used generative AI and AI-assisted technologies during the preparation of this work.

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