

Evaluating the Role of e-Backcasting in Enhancing Social Learning for Sustainable City Development: A Case Study of Abuja, FCT

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Abstract:- The growing complexity of urban planning challenges in Nigerian cities necessitates participatory and adaptive approaches to achieving sustainability. This study evaluates the effectiveness of e-backcasting as a tool for enhancing social learning among diverse stakeholders in Abuja, Nigeria. Using a prototype participatory valuation approach, 239 participants aged 18 to 68 engaged in online deliberative processes via social media platforms such as Facebook, WhatsApp, blogs, and emails. The findings revealed that participants experienced significant improvements in critical thinking, collaborative interaction, and sustainable city concepts. Over 46% of participants reported that the process positively impacted their goal-setting abilities. The study highlights how e-backcasting fosters flexibility, inclusivity, and interaction, creating a social learning environment for sustainable urban planning. Policy recommendations emphasize adopting e-backcasting in city governance to facilitate collective decision-making and enhance urban sustainability in Nigeria.

Keywords:- e-Backcasting, Social Learning, Participatory Planning, Sustainable City Development, Abuja.

I. INTRODUCTION

The rapid urbanization occurring in cities such as Abuja, Nigeria, presents significant challenges related to sustainable city development, highlighting the need for participatory and adaptive governance models. The increasing complexity of these challenges demands innovative approaches that involve the community in decision-making processes. One such approach is e-backcasting, a participatory method that integrates digital technologies to encourage collaboration and critical thinking among stakeholders, aiming to achieve sustainability in urban planning [1]. E-backcasting is particularly effective in settings where traditional planning approaches may fall short in engaging diverse groups of citizens [2].

Social learning, a concept linked to collective knowledge generation and mutual learning, is fundamental to sustainable urban planning [3]. By utilizing digital platforms, e-backcasting facilitates social learning by connecting different stakeholders, enabling them to engage in discussions that shape the future of their urban environment. In Nigeria, urban planning often lacks the inclusivity

necessary for equitable and sustainable development, making e-backcasting a timely and relevant tool in addressing these issues [4]. This study investigates the role of e-backcasting in enhancing social learning for sustainable city development in Abuja, focusing on how the process promotes collaboration and forward-thinking among participants.

II. CONCEPTUAL FRAMEWORK / LITERATURE REVIEW

Urban planning in rapidly urbanizing regions like Abuja faces numerous challenges, particularly the need for integrated and participatory approaches that emphasize sustainability and inclusivity. As cities grow, traditional planning methods that exclude marginalized communities often fail to address pressing issues such as infrastructure deficits, environmental degradation, and social inequality [5]. E-backcasting, a tool that supports participatory planning through online platforms, has emerged as a powerful method for overcoming these challenges. This approach encourages stakeholders, including residents, policymakers, and planners, to collectively envision and plan for a sustainable future.

The concept of e-backcasting stems from backcasting, a planning approach that begins with defining a desirable future and then identifies the steps needed to reach that future [6]. Unlike forecasting, which is based on existing trends, backcasting starts with a vision of sustainability and works backward to determine the actions required to achieve that vision. E-backcasting adapts this model by integrating digital technologies to engage a broader range of participants, ensuring more inclusive and transparent planning processes [7]. In urban contexts, where collaboration is crucial for addressing complex sustainability challenges, e-backcasting enables diverse groups to work together in identifying solutions that reflect their collective values and aspirations.

Social learning plays a crucial role in the success of e-backcasting, as it promotes collaborative decision-making and knowledge sharing among stakeholders. Research has shown that when individuals engage in social learning, they develop a deeper understanding of the issues at hand, leading to more informed and sustainable choices in urban planning [8]. Moreover, e-backcasting facilitates this type of learning by providing a platform for participants to interact, share ideas, and co-create solutions to urban problems. This

process fosters critical thinking, reflection, and a sense of shared responsibility for the future of the city.

Several studies have highlighted the potential of e-backcasting for promoting sustainability in urban planning. For instance, Bai et al. (2022) demonstrate how digital platforms can facilitate stakeholder engagement in sustainable urban development, emphasizing the need for collaborative governance in cities of the global south [9]. Additionally, Mansour and Tawfik (2022) argue that digital tools, such as e-backcasting, are key to addressing the challenges posed by urbanization in developing countries by promoting social learning and collective action [10].

III. METHODOLOGY

The study employed a mixed-methods approach to evaluate the role of e-backcasting in enhancing social learning for sustainable city development in Abuja, Nigeria. A prototype participatory valuation approach was used to facilitate the online deliberative processes. A total of 239 participants, ranging in age from 18 to 68, engaged in the process through social media platforms including Facebook, WhatsApp, blogs, and email. These platforms allowed participants to engage in asynchronous discussions, providing a space for reflection and knowledge sharing over a period of three months.

The participants were selected through a combination of purposive and snowball sampling methods, ensuring that a diverse cross-section of Abuja’s urban population was represented. This diversity included participants from various educational backgrounds, occupations, and neighborhoods, ensuring that the study captured a broad spectrum of perspectives on sustainable urban development.

Data were collected through surveys and online discussions, and qualitative analysis was used to assess the impact of the e-backcasting process on participants' social learning outcomes. Pre- and post-participation surveys were administered to measure changes in participants' critical thinking, goal-setting abilities, and understanding of sustainable city concepts. Additionally, qualitative feedback from the online discussions was analyzed to identify key themes related to collaboration, social learning, and sustainability.

IV. RESULTS AND DISCUSSION

The findings from this study reveal that e-backcasting was effective in enhancing participants' critical thinking, collaborative skills, and understanding of sustainable city development. The use of online platforms to facilitate deliberation allowed participants to engage in meaningful discussions and contribute to the creation of solutions that considered the long-term sustainability of Abuja. These findings demonstrate the potential of e-backcasting as a valuable tool for social learning in urban planning.

➤ Participant Demographics

The study involved 239 participants, representing diverse demographics in terms of age, education level, and professional background. The breakdown of the participants, as shown in Table 1, highlights that the majority were between the ages of 18 and 35, with a significant proportion holding tertiary or postgraduate education. The professional categories of participants ranged from urban residents and planners to policymakers and civil society members, reflecting a broad spectrum of stakeholders in the urban planning process.

Table 1 Participant Demographics

Demographic Variable	Category	Frequency (n=239)	Percentage (%)
Age Group	18-25	72	30.1
	26-35	85	35.6
	36-50	58	24.3
	51-68	24	10.0
Education Level	Secondary Education	45	18.8
	Tertiary Education	165	69.0
	Postgraduate	29	12.2
Professional Category	Urban Residents	95	39.7
	Planners/Academics	68	28.5
	Policymakers	45	18.8
	Civil Society Members	31	13.0

➤ Enhanced Critical Thinking and Knowledge Exchange

The e-backcasting process had a significant impact on participants' critical thinking abilities. Participants showed considerable improvements in their capacity to identify urban challenges, analyze sustainable solutions, and understand the

interconnections of urban issues. Table 2 presents the results of the pre- and post-survey, indicating that participants were better able to engage with urban issues after the e-backcasting process, with improvements ranging from 32% to 35%.

Table 2 Critical Thinking Outcomes

Critical Thinking Indicators	Before (%)	After (%)	Improvement (%)
Ability to Identify Urban Challenges	42.5	76.2	33.7
Capacity to Analyze Sustainable Solutions	39.8	72.0	32.2
Understanding Interconnections of Urban Issues	35.1	70.8	35.7
Proposing Innovative and Practical Interventions	30.6	65.4	34.8

These results underscore the significant improvements participants experienced in critical thinking, enabling them to actively contribute to the creation of solutions that address urban sustainability.

➤ *Collaborative Interaction and Stakeholder Engagement*

The online platforms used in the study facilitated high levels of engagement and interaction among participants. As

shown in Table 3, a majority of participants actively participated in discussions, provided feedback, and collaborated across different sectors. The use of social media was particularly effective in fostering inclusivity, as it lowered barriers to participation and encouraged input from a wide range of stakeholders, including those traditionally excluded from planning processes.

Table 3 Metrics of Collaborative Interaction

Interaction Metrics	Frequency (n=239)	Percentage (%)
Active Participation in Discussions	195	81.6
Engagement with Online Feedback	182	76.2
Cross-Sectoral Collaboration	163	68.2
Sharing of Knowledge and Ideas	178	74.5

These results suggest that the use of online deliberation platforms effectively promoted social learning and inclusivity by engaging a diverse range of participants in discussions, knowledge sharing, and cross-sectoral collaboration.

➤ *Improved Goal-Setting Abilities*

The e-backcasting process also had a positive impact on participants' ability to set sustainable development goals. As

shown in Table 4, nearly half of the participants reported improvements in envisioning long-term goals, aligning short-term actions with long-term visions, and developing clear and realistic action plans. These findings highlight the potential of e-backcasting to improve participatory planning processes by helping stakeholders set actionable goals that align with sustainable city development.

Table 4 Goal-Setting Improvements

Goal-Setting Indicators	Participants Reporting Improvement (%)
Ability to Envision Long-Term Sustainable Cities	46.4
Aligning Short-Term Goals with Future Visions	42.7
Developing Clear and Realistic Action Plans	40.5
Prioritizing Sustainability Objectives	48.9

➤ *Fostering Sustainable City Concepts*

Finally, the e-backcasting process helped participants develop a more comprehensive understanding of the concepts central to sustainable city development. As demonstrated in Table 5, participants showed significant improvements in their understanding of environmental sustainability, social

inclusion, and economic resilience—key components of a sustainable urban future. These findings highlight the effectiveness of e-backcasting in enhancing participants' knowledge and engagement with sustainable urban concepts, which is crucial for informed and effective urban planning.

Table 5 Understanding Sustainable City Concepts

Sustainable City Concept	Before (%)	After (%)	Improvement (%)
Environmental Sustainability	41.5	74.2	32.7
Social Inclusion and Equity	38.9	70.5	31.6
Economic Resilience	34.2	68.1	33.9

The significant improvements across all dimensions suggest that e-backcasting fosters a deeper understanding of sustainability, equipping participants with the knowledge needed to contribute meaningfully to urban planning processes.

V. CONCLUSION AND POLICY RECOMMENDATIONS

This study highlights the potential of e-backcasting as a tool for enhancing social learning and promoting sustainable city development in Abuja. By fostering collaboration, critical thinking, and shared responsibility, e-backcasting provides an effective means of engaging diverse stakeholders

in the planning process. The study recommends that city governance structures in Abuja and other Nigerian cities adopt e-backcasting as a regular tool for participatory planning, as it helps bridge gaps between citizens and policymakers, ensuring that the voices of all stakeholders are heard and considered in decision-making processes.

Policymakers should invest in digital platforms that facilitate e-backcasting and other forms of participatory planning. These platforms offer an accessible and effective way to engage a wide range of urban residents in discussions about the future of their cities. Furthermore, efforts should be made to enhance digital literacy among urban residents, particularly in underserved communities, to ensure that all citizens can participate in these processes.

Ultimately, e-backcasting can play a significant role in transforming urban governance in Nigeria, creating more inclusive, collaborative, and sustainable cities for the future.

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