IDENTIFICATION AND PRIORITIZATION OF CLIMATE RESILIENT URBAN GOVERNANCE INDICATORS FOR VULNERABLE CITIES OF BANGLADESH: INSIGHTS FROM THE LOCAL STAKEHOLDERS & THE EXPERTS OPINION

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ABSTRACT

Objective: Amidst urbanization, prioritizing resilience is crucial for climate adaptation. A climate-resilient urban governance framework evaluates risks, forms resilience, and mitigates climate change impacts. This research intends to identify vital indicators for resilient urban governance in Bangladesh, aiding climate risk reduction and supporting community resilience.

Theoretical Framework: This study fills a research gap in prior studies by investigating urban governance in Bangladesh's vulnerable cities through governance and climate resilience theories. It recognizes crucial indicators for resilient governance, focusing on stakeholder participation and public engagement. Through literature review and the Delphi survey, it strengthens policy development, signifying climate resilience and adaptive capacity in nation’s urban regions.

Method: The study encompasses an extensive literature review and engagement with diverse stakeholders through focus group discussions and in-depth interviews. The Delphi survey method was utilized to discover the pivotal climate resilience indicators in urban governance based on various experts' perspectives, with data analysis encompassing sorting and Likert scale assessment to highlight the most important indicators of a climate-resilient governance system.

Results and Discussion: The study highlights the critical influence of the most essential indicators on the advancement of urban good governance factors informed by stakeholders and experts to foster accountability, transparency, and resilience in urban governance practices.

Research Implications: This study contributes to the field by providing a structured approach for identifying and prioritizing indicators of climate resilient urban governance of Bangladesh. It furnishes urban planners and legislators in crafting targeted.

Keywords: local governance, stakeholders participation, expert opinion, climate change vulnerability.

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IDENTIFICAÇÃO E PRIORIZAÇÃO DE INDICADORES DE GOVERNANÇA URBANA RESILIENTES AO CLIMA PARA CIDADES VULNERÁVEIS DE BANGLADESH: INSIGHTS DAS PARTES INTERESSADAS LOCAIS E A OPINIÃO DOS ESPECIALISTAS

RESUMO

Objectivo: Em meio à urbanização, dar prioridade à resiliência é crucial para a adaptação climática. Um quadro de governança urbana resiliente às alterações climáticas avalia os riscos, cria resiliência e mitigar os impactos das alterações climáticas. Esta investigação pretende identificar indicadores vitais para uma governança urbana resiliente no Bangladesh, auxiliando na redução dos riscos climáticos e apoio a resiliência comunitária.

Enquadramento Teórico: Este estudo preenche uma lacuna de investigação em estudos anteriores, investigando a governança urbana nas cidades vulneráveis do Bangladesh através de teorias de governação e resiliência climática. Reconhece indicadores cruciais para uma governança resiliente, centrando-se na participação das partes interessadas e no envolvimento público. Através da revisão da literatura e do inquérito Delphi, fortalece o desenvolvimento de políticas, significando resiliência climática e capacidade de adaptação nas regiões urbanas do país.

Método: O estudo abrange uma extensa revisão da literatura e envolvimento com diversas partes interessadas através de discussões em grupos focais e entrevistas aprofundadas. O método de inquérito Delphi foi utilizado para descobrir os principais indicadores de resiliência climática na governança urbana com base nas perspectivas de vários especialistas, com análise de dados abrangendo classificação e avaliação em escala Likert para destacar os indicadores mais importantes de um sistema de governação resiliente ao clima.

Resultados e Discussão: O estudo destaca a influência crítica dos indicadores mais essenciais no avanço dos factores de boa governança urbana informados pelas partes interessadas e especialistas para promover a responsabilização, a transparência e a resiliência nas práticas de governança urbana.

Implicações de investigação: Este estudo contribui para o terreno ao fornecer uma abordagem estruturada para identificar e priorizar indicadores de governança urbana resiliente às alterações climáticas no Bangladesh. Ele fornece aos planejadores urbanos e legisladores a elaboração de metas direcionadas.

Palavras-chave: governança local, participação das partes interessadas, opinião de um ‘expert, vulnerabilidade às alterações climáticas.
la gobernanza urbana en las ciudades vulnerables de Bangladesh a través de teorías de gobernanza y resiliencia climática. Reconoce indicadores cruciales para una gobernanza resiliente, centrándose en la participación de las partes interesadas y el compromiso público. A través de la revisión de la literatura y la encuesta Delphi, fortalece el desarrollo de políticas, lo que significa resiliencia climática y capacidad de adaptación en las regiones urbanas de la nación.

Método: El estudio abarca una extensa revisión de la literatura y la participación de diversas partes interesadas a través de discusiones de grupos focales y entrevistas en profundidad. Se utilizó el método de encuesta Delphi para descubrir los indicadores fundamentales de resiliencia climática en la gobernanza urbana basándose en las perspectivas de varios expertos, con análisis de datos que abarcaron clasificación y evaluación en escala Likert para resaltar los indicadores más importantes de un sistema de gobernanza resiliente al clima.

Resultados y discusión: El estudio destaca la influencia crítica de los indicadores más esenciales en el avance de los factores de buena gobernanza urbana informados por partes interesadas y expertos para fomentar la rendición de cuentas, la transparencia y la resiliencia en las prácticas de gobernanza urbana.

Implicaciones de la investigación: Este estudio contribuye al campo al proporcionar un enfoque estructurado para identificar y priorizar indicadores de gobernanza urbana resiliente al clima en Bangladesh. Proporciona a los planificadores urbanos y a los legisladores la elaboración de objetivos específicos.

Palabras clave: gobernanza local, participación de las partes interesadas, opinión experta, vulnerabilidad al cambio climático.

1 INTRODUCTION

Climate change worsens urban poverty in cities of Bangladesh, impacting employment, infrastructure, and city systems (Banks et al., 2011). Effective governance is essential for climate resilience, comprising early warning systems, scientific freedom, collaborative policies, and effective disaster management (Chen et al., 2022; Mysiak et al., 2018). Nonetheless, Bangladesh's current governance faces obstacles like insufficient authority, poor collaboration, and financial constraints (Tanner et al., 2009). Enhancing resilience is important for managing natural resources and safeguarding vulnerable communities (Jabeen, 2019; Ahmed et al., 2016).

Previously, the governance of Bangladesh accentuated on rural climate resilience, implementing several programs for vulnerable rural communities (Jahan et al., 2011). Koontz and Newig (2014) state that, the conventional top-down method is used by government professionals to make proposals while the bottom-up approach supports synchronized watershed management and stakeholder participation. The synthesis of the references underscores that to address the susceptibilities of low-income groups and urban informal settlements residents, thorough analysis of the merits and demerits of
urban governance is a requirement and this results research gap on climate resilient governance in vulnerable cities of Bangladesh. Hence, this research aims to identify indicators of urban climate resilience governance as a prime decision-making tool for policy-making in susceptible cities of Bangladesh to fight future climate change consequences.

2 CONTEXT OF CASE STUDY AREAS

This research scrutinizes climate change vulnerability in Khulna, Barisal, Rajshahi, Rangpur, and Sylhet (Table.01) highlighting the necessity for climate-resilient urban governance to alleviate socio-economic effects and enrich livelihoods (Hossain & Fernández-Güell, 2022).

<table>
<thead>
<tr>
<th>District</th>
<th>Rank</th>
<th>Population in 2020 (Millions)</th>
<th>Area (Sq. Km)</th>
<th>Elevation (Meter)</th>
<th>Climate change risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khulna</td>
<td>3</td>
<td>0.95</td>
<td>50.61</td>
<td>9</td>
<td>Cyclone, Salinity</td>
</tr>
<tr>
<td>Sylhet</td>
<td>4</td>
<td>0.90</td>
<td>97.18</td>
<td>21</td>
<td>Flash flood</td>
</tr>
<tr>
<td>Rajshahi</td>
<td>5</td>
<td>0.85</td>
<td>41.85</td>
<td>35</td>
<td>Drought</td>
</tr>
<tr>
<td>Barishal</td>
<td>8</td>
<td>0.48</td>
<td>69.19</td>
<td>1.22</td>
<td>Cyclone, Salinity</td>
</tr>
<tr>
<td>Rangpur</td>
<td>10</td>
<td>0.43</td>
<td>42</td>
<td>34</td>
<td>Drought, Flood</td>
</tr>
</tbody>
</table>

Source: Climate vulnerable urban development in Bangladesh: building climate resilient urban governance in intermediate cities (Hossain, M. & Fernández-Güell, 2022).

3 METHODOLOGY

The study focused on mixed methodology, employing extensive literature review and stakeholders’ perspectives. Good governance is fundamental for urban administration, providing adaptability, proficiency, impartiality, sustainability, and balance to city management (Hendriks, 2013). It performs as a conceptual framework that reshapes our understanding of politics and transparency of cities (Raco, 2020). In Bangladesh, governance is stuck by incompetent management, vague policies, and scarce stakeholder participation, disturbing service delivery (Karim, 2023). The lack of climate preparation and rapid urbanization further challenges city resilience. So, climate resilience in urban governance is crucial, including vulnerability assessments and resilience approaches to tackle immediate risks and long-term challenges (Chen et al.,
Recent research accentuates ecological spatial optimization and infrastructure for climate-resilient urban advancement (Liang, 2021). The connection between public health preparedness and governance emphasizes its role in improving resilience to climate-related disasters (Zhang & Guo, 2022). Thus, fostering climate-resilient governance is important for disaster-prone communities in Bangladesh. The urban governance framework in Bangladesh comprises five principles of good governance in Asia (Mehta, 1998):

a) Decentralization and Autonomy;
b) Transparency and Accountability;
c) Responsiveness and Flexibility;
d) Participation and Inclusion;
e) Experience and Support;

The research collected perceptions from local stakeholders and experts through multiple phases. Firstly, focus group discussions with 180 participants across multiple regions collected diverse opinions. Snowball sampling was then utilized for interviews to understand climate-affected individuals' views on risks and adaptation strategies. In-depth interviews with urban experts, social work professionals, and government officials stressed governance challenges and key indicators. Two rounds of Delphi survey with 10 experts refined and prioritized these findings using a 5-point Likert scale (Table.02). Analysis of Delphi round 2 results, using the mean ($\bar{x}$), confirmed methodological consistency and consensus, as per Platzer (2006) and Geist (2010). Judgment matrices were used to know the indicator ranking using following formulas 1 and 2, given below:

\[
\text{Mean, } \bar{x} = \frac{\Sigma x_i}{n} \quad (1)
\]

Where:

$\bar{x}$ = the mean value of the set of given data.

$x_i$ = data value

$n$ = total number of data values

\[
\text{Standard Deviation, } \sigma = \sqrt{\frac{\Sigma (x_i - \bar{x})^2}{N}} \quad (2)
\]
Where:

\[ \bar{x} = \text{the mean value of the set of given data.} \]
\[ x_i = \text{data value} \]
\[ N = \text{total number of data values} \]
\[ \sigma = \text{Value of Standard Deviation} \]

### Table 2

**Indicators of Good Governance obtained through theoretical framework and stakeholder’s opinion**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Theoretical Framework Indicators</th>
<th>Sources</th>
<th>Stakeholder’s opinion based Indicator</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralization and Autonomy</td>
<td>Respect towards diversity</td>
<td>(Bennett et al., 2021)</td>
<td>Regional Systems</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td></td>
<td>Sense of ownership</td>
<td>(MOVSIYAN et al., 2022; Otoo &amp; Danquah, 2021)</td>
<td>Adaptation to changing circumstances</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Number of local governments, jurisdictions</td>
<td>(Carbonnier, 2013)</td>
<td>Incorporation of innovative approaches</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Transparent flow of information</td>
<td>(Skandylas et al., 2020)</td>
<td>Employ iterative methods</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Presence of autonomous areas</td>
<td>(Mora-Sanguinetti &amp; Spruk, 2022)</td>
<td>Capacity Building</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td>Transparency and Accountability</td>
<td>Public access to data and records</td>
<td>(Johnson &amp; George, 2023; Tintswalo et al., 2021)</td>
<td>Support for community based measures</td>
<td>In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Independent monitoring and auditing</td>
<td>(Tintswalo et al., 2021)</td>
<td>Accessibility to services</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td></td>
<td>Compliance with legal and ethical standards</td>
<td>(Minkkinen et al., 2022)</td>
<td>Opportunities for involvement</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Impartial dispute resolution mechanisms</td>
<td>(Mousseau, 2023)</td>
<td>Co-operative partnership</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
<tr>
<td></td>
<td>Appropriate feedback with respect to performance</td>
<td>(Fairbanks et al., 2007)</td>
<td>Qualified Personnel</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td></td>
<td>Availability of information</td>
<td>(Zuiderwijk &amp; Janssen, 2014)</td>
<td>Technical support and advisory assistance</td>
<td>In Depth Interview</td>
</tr>
<tr>
<td>Responsiveness and Flexibility</td>
<td>Regular review and evaluation</td>
<td>(Zhao, 2011; Caughey &amp; Warshaw, 2017)</td>
<td>Regional Systems</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td></td>
<td>Resource Flexibility</td>
<td>(Heaton et al., 2022; Cosens, 2013)</td>
<td>Adaptation to changing circumstances</td>
<td>Focus Group Discussion &amp; In Depth Interview</td>
</tr>
</tbody>
</table>
4 RESULTS AND DISCUSSIONS

4.1 RANKING PROCEDURE OF THE INDICATORS THROUGH DELPHI SURVEY:

These indicators were ordered using a Likert scale of 5. When indicators of the same parameter had tied Standard Deviation values, their ranking was acquired through the local stakeholders’ insights and a thorough literature review.

4.1.1 Decentralization and Autonomy

Table 3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralization and Autonomy</td>
<td>Distinct regional systems</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4.571</td>
<td>4.070</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Respect towards diversity</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>4.285</td>
<td>3.891</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sense of ownership</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4.285</td>
<td>3.817</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Number of local governments, jurisdictions</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>4.142</td>
<td>3.779</td>
<td>4</td>
</tr>
</tbody>
</table>
The ranking of "Decentralization & Autonomy" indicators (Table.03) accentuates the importance of distinct regional systems for program design and submission to central authorities, assisting regional development (Aminah, 2020; Zein et al., 2022). In Bangladesh's intermediate cities, dependence on the central government, absence of autonomy, and financial restrictions persist. Political partialities and scarce resources hinder full decentralization and autonomy, highlighting the need for transparency and community engagement, as stated by Debi Chowdhurani (DCPUK, Rangpur). Thus, this ranking reflects the significance of transparency, autonomy, inclusivity, community engagement, and governance structure consistency in promoting effective decentralization and autonomy.

4.1.2 Transparency and Accountability

Table 4

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency and Accountability</td>
<td>Data accessibility for the public</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>4.714</td>
<td>4.208</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Compliance with legal,moral principles</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>4.714</td>
<td>4.208</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Independent observation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>4.714</td>
<td>4.208</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Appropriate feedback</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4.285</td>
<td>3.817</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Unbiased dispute resolution</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>4.142</td>
<td>3.779</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Availability of data</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3.664</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:*Response scales are as follows:
1. Unimportant; 2. Of little importance; 3. Moderately important; 4. Important; 5. Very important
Research underscores the significance of data accessibility in augmenting transparency and accountability in governance (Schmidthuber et al., 2023). Providing raw data shapes citizen’s trust and citizen participation, leading to efficient climate challenge responses (Beshi & Kaur, 2019). It also assists in eradicating corruption (Sofyani et al., 2021) and fostering good governance (Meier et al., 2021). While legal and moral principles are indispensable for stability and justice (Zahid & Jahan, 2023), relying solely on them tackle the dynamic climate disturbances. Prioritizing data accessibility requires evidence-based decision-making and quick policy adaptation to climate change challenges (Jannah & Sipahutar, 2022). Although independent observation is necessary (Meijer, 2013), it can be unproductive without accessible data and it lacks the power to impose governance changes. The World Bank underscores the importance of legal frameworks for transparency and accountability (Al-Naser, 2019). So, data accessibility takes precedence, followed by legal and moral adherence, independent observation, feedback, and unbiased dispute resolution as shown in Table.04.

4.1.3 Responsiveness and Flexibility:

Table 5

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td>Regular evaluation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td></td>
<td>4.857</td>
<td>4.342</td>
<td>1</td>
</tr>
<tr>
<td>Flexibility in budgeting</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td></td>
<td>4.857</td>
<td>4.342</td>
<td>2</td>
</tr>
<tr>
<td>Integration of stakeholder</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td></td>
<td>4.571</td>
<td>4.174</td>
<td>3</td>
</tr>
<tr>
<td>Adaptation to changing circumstance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td></td>
<td>4.571</td>
<td>4.070</td>
<td>4</td>
</tr>
<tr>
<td>Employ iterative methods</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td></td>
<td>4.428</td>
<td>3.964</td>
<td>5</td>
</tr>
<tr>
<td>Incorporation of innovative approaches</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td></td>
<td>4.428</td>
<td>3.927</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:*Response scales are as follows: 1. Unimportant; 2. Of little importance; 3. Moderately important; 4. Important; 5. Very important

For tackling climate change and crises, the debate between "regular evaluation" and "flexible budgeting" is critical for governance responsiveness and flexibility, . According
to Mamun & Chowdhury (2022), regular evaluation provides a structured framework for fiscal health and good governance procedures, ensuring competent resource supervision and community alignment (Biswas et al., 2022). Conversely, flexible budgeting is indispensable for responsive governance, supporting crisis response and grassroots participation (Mahmud, 2021). However, focus group discussions and field studies in Rangpur disclose governance inadequacies and partialities, highlighting the necessity for regular evaluation to safeguard effective resource use and preserve budgetary flexibility in Bangladesh’s climate-affected urban areas. Thus, regular evaluation ranked over flexible budgeting, afterwards stakeholder engagement and adaptive, innovative tactics respectively (Table.05).

4.1.4 Participation and Inclusion:

Table 6
Indicators of Participation and Inclusion.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity-building</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>4.428</td>
<td>4.035</td>
<td>1</td>
</tr>
<tr>
<td>Continuous monitoring</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>4.428</td>
<td>4.035</td>
<td>2</td>
</tr>
<tr>
<td>Backing for community-led initiatives</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>4.285</td>
<td>3.891</td>
<td>3</td>
</tr>
<tr>
<td>Service Accessibility</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>4.285</td>
<td>3.891</td>
<td>4</td>
</tr>
<tr>
<td>Opportunities for involvement</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>4.142</td>
<td>3.741</td>
<td>5</td>
</tr>
<tr>
<td>Allowance for feedback</td>
<td></td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>3.857</td>
<td>3.545</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:*Response scales are as follows:
1. Unimportant; 2. Of little importance; 3. Moderately important; 4. Important; 5. Very important

Prioritizing capacity building over regular monitoring is vital for augmenting participation and inclusion in climate resilience and adaptation decision-making (Leeman et al., 2016). Capacity building empowers stakeholders, upholds collaboration, and promotes sustainable development (Fallov, 2010). While monitoring provides accountability, particularly in the public sector (Muhtar et al., 2021). BRAC Ultra-Poor Graduation Programme is key to addressing service access and capacity building in Rangpur, Sylhet, and Barisal, particularly through their initiatives. Urban governance in
these cities displays flexibility in adapting plans to unforeseen circumstances, guaranteeing relevance. Capacity building nurtures proficiency and empowers marginalized communities (Kalogiannidis et al., 2023). Community-led initiatives in Khulna, Barisal, Rangpur, and Sylhet empower citizens, prioritize local essentials, and create impartial economic opportunities, necessary for inclusive governance amidst climate challenges. Thus, community-led initiatives are ordered over service accessibility that ranks fourth, followed by opportunities for involvement and feedback allowance as shown in Table.06.

4.1.5 Experience and Support

Table 7
Indicators of Experience and Support.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience and Support</td>
<td>Cooperative partnerships</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>4.714</td>
<td>4.208</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Clear roles &amp; workflows</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>4.714</td>
<td>4.208</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Accessibility of pertinent resources</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4.571</td>
<td>4.070</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Usage of relevant data</td>
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<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4.571</td>
<td>4.070</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Technical Assistance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4.571</td>
<td>4.070</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Qualified personnel</td>
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<td>0</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>4.428</td>
<td>3.927</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes: *Response scales are as follows:
1. Unimportant; 2. Of little importance; 3. Moderately important; 4. Important; 5. Very important

Cooperative partnerships are key for good governance and to address climate change issues. Inclusive approaches through partnerships facilitate collective decision-making and resource-sharing, essential for dealing with complex issues (Teisman & Klijn, 2002). Inter-municipal collaborations, such as in waste management, validate their efficiency (Tobin & Zaman, 2022). Public-private partnerships are also vital during crises like COVID-19 (Seddighi et al., 2020).

In Bangladesh, cooperative partnerships develop governance by maximizing resource utilization and integrating varied perspectives, essential for climate-related concerns. Focus group discussions in Barisal and Khulna accentuate the importance of these collaborations, while Rajshahi and Rangpur show a lack of such efforts. Good
governance for climate change in Bangladesh necessitates relevant data and technical assistance. Data utilization assists in understanding climate patterns and vulnerabilities, while technical assistance supports informed decision-making. However, resource availability is paramount, as robust approaches require financial, informational, and infrastructural assistance.

In 1990’s, Bangladesh saw shift from crops to shrimp aquaculture because of rising salinity, boosting the economy however increasing disparity and environmental degradation (Hossain et al., 2013). Similarly, projects for increasing connectivity like the Haor Road caused unintended flooding (Debu, 2022). Engaging local stakeholders in climate resilience planning is indispensable. As data-driven approaches recognize vulnerable areas for targeted interventions (Schramm et al., 2020), making data utilization an important indicator, followed by technical assistance and qualified personnel (Table.07).

4.2 PRIORITIZATION OF THE INDICATORS

The prioritization of governance indicators in figure.01, reveals that indicator’s scores above 4.10 represent highest priority, with "Responsiveness and Flexibility" indicators scoring highest (4.342 to 3.964). Among them regular evaluation and budget flexibility (4.342) are crucial for urban climate resilience, strengthening strategic resource use and economic development (Biplob, 2019; Ferdaus & Hossain, 2019; Makhdum et al., 2022). Data accessibility (4.208) improves transparency and trust of citizens (Ariansyah & Maulida, 2022). Compliance with legal principles, stakeholder inclusion, role clarification, and independent oversight are pivotal (Cosens et al., 2017; Yousaf et al., 2016). Less important indicators include unbiased dispute resolution and feedback facilitation. "Decentralization and Autonomy" and "Participation and Inclusion" scored lowest (3.545) among the indicators.

Previous researches on urban good governance highlights varied priorities. Zhao (2018) emphasizes public involvement, while Hendriks (2013) prioritize sustainable growth and corporate governance. Faria et al. (2009) focuses on cities environmental governance for societal sustainability, and Grindle (2007) associates fiscal decentralization with good governance. Previous studies in Bangladesh have been general study including numerous factors of good governance without a specific concentration on
Bangladesh (De Faria et al., 2009) or investigated only one city (Loveridge, 2001) or viewed solely from a political perspective (State of Governance in Bangladesh: Problems and Prospects. Munich Personal REPEC Archive, n.d.). This research looks into climate-resilient urban governance in Bangladesh focusing on multiple vulnerable cities of the nation and accentuating the crucial environmental aspect for urban good governance. While several studies highlight different features of urban governance adopting comprehensive method considering diverse perceptions and environmental contexts is necessary (Zhao, 2018; Faria et al., 2009). Integrating these indicators can foster to the formation of robust governance frameworks, nurturing resilience, responsiveness, and inclusivity in vulnerable urban areas of Bangladesh.

Figure 1

The prioritization structure of indicators of good governance by Delphi Survey.
5 CONCLUSION

This research aims to establish a unified, hierarchical system of urban good governance indicators for policy development in climate-affected, vulnerable urban areas of Bangladesh. The study addresses a gap in the literature by introducing five governance parameters, each with 5 to 6 indicators, derived from expert rankings via a Delphi survey. Key indicators identified include "regular auditing" and "flexibility in budgeting" under "responsiveness and flexibility," along with stakeholder integration, clear roles and responsibilities, independent oversight, adherence to legal and ethical principles, public data access, continuous monitoring, staff training, and resource access. Medium importance indicators include responsiveness and a sense of belonging, while less important indicators involve data availability, transparent information flow, public participation, impartial dispute resolution, and the number of local governments. Least significant were feedback allowances and presence of falloff areas. These findings introduce new insights into urban governance for climate-affected regions in Bangladesh, guiding decision-makers in adapting livelihoods, and ensuring resilient energy and water management for vulnerable populations.

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