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Navigating Environmental Migration: Legal Frameworks in Bangladesh

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Abstract:

Purpose: This quantitative research, conducted using SmartPLS 4 within the framework of Structural Equation Modeling (SEM), aims to address the critical gap in Bangladesh's environmental laws concerning provisions for climate-induced migrants. Motivated by the insights of Hammond et al. (2010) and the urgency highlighted by the World Bank Group, the study investigates the extent to which existing policies, community participation, international collaborations, and socio-economic considerations influence the presence and adequacy of legal provisions for migrants.

Design: Employing SmartPLS 4, the research applies a comprehensive measurement model with five constructs: Policy Effectiveness in Addressing Climate-Induced Migration (PECAM), Community Participation in Policy Formulation (CPFP), International Cooperation and Agreements (ICA), Socio-Economic Impact on Climate-Induced Migrants (SEICIM), and the Dependent Variable - Environmental Law Provisions for Migrants (ELP_fM). The constructs are drawn from validated scales as per the works of Biswas and Chowdhury (2012), Barua et al. (Young Power Soc Action, 39), K. M. & C. K. (2021), Tania, Tasnim, and Islam (2023), and Ahsan (2019). The study employs factor loadings, reliability, and discriminant validity assessments to ensure the robustness of the measurement model.

Findings: The research reveals that policy effectiveness, community participation, international collaboration, and socio-economic considerations significantly influence the presence and adequacy of environmental law provisions for migrants. The positive and statistically significant path coefficients suggest direct links between these factors and the dependent variable, affirming the need for comprehensive strategies. The study underscores the importance of collaborative efforts involving governmental bodies and key organizations, as identified in the managerial implications. The findings contribute to the discourse on climate-induced migration and provide actionable insights for policymakers, NGOs, and international entities involved in addressing the rights and needs of the affected population.

Keywords: climate-induced migration, environmental law provisions, policy effectiveness, community participation, international cooperation, socio-economic impact, Bangladesh, smart PLS 4, SEM.

Introduction: Climate-induced migration poses significant challenges globally, with vulnerable populations, particularly in Bangladesh, experiencing the profound impacts of environmental changes. Amidst these challenges, the focus on addressing the rights and needs of climate-induced migrants within the legal framework becomes paramount. This article delves into the intricate landscape of environmental law provisions for migrants in the context of Bangladesh, aiming to unravel the gaps, assess policy effectiveness, explore community participation, analyze international cooperation, and understand the socio-economic impact on affected populations.

As climate change continues to disrupt livelihoods, displacement becomes a harsh reality for many. Despite the existence of environmental laws, the specific provisions catering to the unique circumstances of migrants are often overlooked. Drawing inspiration from the works of scholars such as Biswas and Chowdhury (2012), this article seeks to shed light on the legal gaps and challenges faced by climate-induced migrants within the intricate fabric of Bangladesh's legal system.

Policy effectiveness is a crucial aspect of addressing climate-induced migration, and this article critically evaluates the impact of existing policies on safeguarding the rights of migrants. The study builds on the insights provided by Barua et al. (Young Power Soc Action, 39), offering a comprehensive analysis of legal and policy responses in the context of climate-induced migration.

Furthermore, the role of communities in shaping policies related to climate-induced migration is explored, emphasizing the need for community participation in decision-making processes. K. M. & C. K.'s research (2021) on climate victim rehabilitation highlights the importance of such involvement, acting as a catalyst for improved rural development actions.

International cooperation and agreements are assessed as pivotal elements in influencing and enhancing legal frameworks for migrants within Bangladesh. Tania, Tasnim, and Islam's work (2023) on the Rohingya refugee crisis provides valuable insights into potential legal remedies, underscoring the role of international organizations and the necessity for comprehensive, legally binding frameworks.

Additionally, the socio-economic impact on individuals and communities affected by climate-induced migration is examined. Ahsan's qualitative study (2019) contributes narratives and insights into the multifaceted challenges faced by displaced individuals, providing a lens through which to understand the socio-economic implications of migration. In navigating these themes, this article aims to contribute to the discourse on climate-induced migration by offering a nuanced understanding of the legal landscape, policy effectiveness, community dynamics, international collaborations, and socio-economic

repercussions. The pursuit of remedies for migrants within Bangladesh's environmental laws forms the crux of this exploration, aiming for a more inclusive and effective strategy to address the challenges posed by climate-induced displacement.

Literature Review: The examination of climate-induced migration, exemplified through the lens of Bangladesh, reveals a critical reliance on soft law frameworks to navigate the complexities of displacement. Alimuddin and Muhammad's (2023) study underscores the inadequacy of traditional legal paradigms in addressing the nuances of climate-induced migration. Leveraging qualitative methodology, the research draws on the Guiding Principles on Internal Displacement, demonstrating their adaptability in offering normative guidance for internally displaced persons affected by climate change (Alimuddin & Muhammad, 2023; Orchard, 2010). This qualitative approach is complemented by Bangladesh's National Adaptation Plan (Ministry of Environment, Forest and Climate Change, 2022), emphasizing the integration of climate adaptation into national development strategies. Notably, the study highlights the proactive role of international organizations, particularly the International Organization for Migration (IOM), evidenced through initiatives like the Displacement Tracking Matrix and provision of aid to internally displaced households (International Organization for Migration, 2016; Bangladesh Red Crescent Society, 2022). The cumulative findings underscore soft law's dynamism in climate-induced migration governance, portraying it as an adaptive mechanism crucial for safeguarding the rights of vulnerable populations.

Examining the legal and policy dimensions of climate-induced migration in Bangladesh, the study emphasizes the imperative of establishing a comprehensive national regulatory framework (Naser, 2015). Conducted through a qualitative research approach, the study critically assesses existing laws and policies, revealing inadequacies in addressing the nuances of climate-induced migration. Notably, it underscores the absence of a dedicated legal framework tailored to this form of displacement. Findings recommend the integration of climate-induced migration considerations into broader legal frameworks related to the environment, climate change, disaster risk reduction (DRR), development, and land management (Naser, 2015). The research highlights the discretionary nature of existing standing orders on disaster management and advocates for proactive policies linking relief assistance, DRR, rehabilitation, and development (Naser, 2015). It further underscores the critical role of reforming land-use laws to ensure equitable distribution and reclaiming illegally occupied lands for resettling climate-induced migrants. The study calls for an integrated approach aligning poverty reduction strategies with climate-induced migration and DRR efforts, emphasizing rational planning and controls to optimize land use and build community resilience (Walsham, 2010; McAdam & Saul, 2010; Fisher, 2010).

Environmental migration poses significant challenges for urban local authorities in Bangladesh, as rapid urbanization, climate change, and population growth intensify migration patterns (Ahsan, 2017). A study by Ahsan (2009) underscores the heightened risks faced by migrants settling in environmentally degraded areas within cities. The research employs a qualitative approach, examining the impact of rapid urban growth on

Dhaka Mega City's environmental landscape (Ahsan, 2009). The challenges faced by migrants include inadequate access to essential services such as water supply and sanitation. Additionally, inadequate waste management and overcrowded living conditions contribute to health risks, emphasizing the urgent need for improved urban planning. The study recommends policy interventions, emphasizing the importance of a national policy on environmental displacement and migration, capacity building for local authorities, and the formation of an association for environmental displaced migrants to address their specific needs (Ahsan, 2009).

Existing research, drawing from diverse sources, underscores the nuanced relationship between climate change and migration decisions, emphasizing the need for context-specific policies (Martin et al., 2013). Kniveton et al. (2011) highlight the heterogeneity of migration decisions, attributing them to individual agency shaped by unique experiences, biases, and perceptions (Kniveton et al., 2011). The study argues against a one-size-fits-all approach, emphasizing the dynamic linkages between climate change and migration. Proposing a proactive policy shift, the literature suggests viewing migration not solely as a threat but as a viable adaptation strategy, particularly for impoverished communities (Barnett and Webber, 2009). The IOM-ADB Policy Dialogues on Climate-Induced Migration (2011) advocate six key policy areas, encompassing migration as a solution, data improvement, capacity building, governance enhancement, urban management integration, and financial mechanisms (IOM & ADB, 2011). Methodologically, research emphasizes comprehensive data gathering, spatial analysis, and a metrics-driven approach to assess adaptation project outcomes (Kniveton et al., 2008; Stadelmann, 2011). This literature calls for inclusive policies recognizing internal migration's efficacy in climate resilience and adaptation.

Existing research in climate-induced migration in Bangladesh, particularly focusing on Dhaka and Cumilla, reveals multifaceted vulnerabilities influenced by economic, demographic, social, political, and physical factors (Schmidt-verkerk, 2011). Schmidt-verkerk's quantitative study identifies poor migrants in Dhaka as highly sensitive due to low income and limited adaptive capacity (Schmidt-verkerk, 2011). Employing a mixed-method approach, findings indicate poor migrants' short-distance mobility in response to riverbank erosion, confirming the correlation between low household income and proximity to the river. Additionally, Zaman's work (1991) underscores the short-distance migration trend among the impoverished, aligning with Massey et al.'s (2010) assertion that environmental factors primarily impact close-range moves (Zaman, 1991; Massey et al., 2010). These insights contribute to comprehending the nuanced dynamics of climate-induced migration, emphasizing the need for context-specific vulnerability assessments and targeted policy interventions.

Research on climate-induced migration, particularly focused on Bangladesh, reveals multifaceted challenges, causes, and consequences (Black et al., 2013). Black et al. (2013) explore migration, immobility, and displacement outcomes post-extreme events, emphasizing the need for integrated sensitivity assessments (Black et al., 2013). Cattaneo

and Peri (2016) delve into the migration response to increasing temperatures, employing quantitative methods to analyze temperature-driven migration patterns (Cattaneo & Peri, 2016). Brown (2007) contributes insights into climate change and forced migration within the Human Development Series, outlining observed, projected, and implied implications (Brown, 2007). The study by Hossain (2007) investigates the poverty and vulnerability nexus in urban Bangladesh, incorporating qualitative approaches to illuminate slum communities' dynamics (Hossain, 2007). Acknowledging the intricate interplay between environmental factors and migration, this body of research underscores the urgency for nuanced policies and recognition of climate refugees within international frameworks.

Dewan's anthropological exploration in coastal Bangladesh provides a nuanced understanding of the intricate interplay between climate change, development, and livelihoods (Dewan, 2023). Grounded in qualitative research, her work, including "Misreading the Bengal Delta," unveils the complexities of adaptation strategies and socio-environmental consequences within the context of climate-induced migration (Dewan, 2023). Employing an ethnographic lens, Dewan dissects the multifaceted impacts of embankment policies and climate-related events on local communities. Through detailed case studies, she sheds light on the gendered dimensions of migration, emphasizing the experiences of women (Dewan, 2023). Additionally, Dewan critically examines the discourse surrounding climate change, exposing how it intersects with development narratives. The research's comprehensive scope, methodological rigor, and attention to the lived realities of those affected underscore its significance in contributing to the academic discourse on climate change, migration, and development in Bangladesh.

Scholarly discourse on the Rohingya refugee crisis in Bangladesh extensively explores the multifaceted challenges faced by this marginalized community (Tania et al., 2023). The research conducted by Tania, Tasnim, and Islam (2023) delves into the legal complexities and human rights implications of the crisis, emphasizing the absence of a binding legal framework (Tania et al., 2023). Their qualitative research, drawing from readings, articles, newspapers, and books, outlines the historical background of the Rohingya people and their plight as stateless individuals (Tania et al., 2023). Addressing the refugee issue's socio-economic dimensions, the study sheds light on Bangladesh's strained resources, environmental impact, and the perceived threat to national security (Tania et al., 2023). With a focus on potential legal remedies, the research advocates for bilateral treaties, international courts, and the pivotal role of organizations such as UNHCR (Tania et al., 2023). The study underscores the need for regional cooperation and a comprehensive, legally binding framework to address the enduring refugee crisis effectively.

Research on climate-induced migration in Bangladesh highlights the intricate interplay between environmental challenges and human mobility (Mallick et al., 2022). Studies, such as the one conducted by Mallick et al. (2022), have employed a mixed-methods approach to investigate migration patterns in the coastal regions (Mallick et al., 2022). Through a comprehensive analysis of socio-economic factors, the research identifies the resilience of local communities, challenging prevailing narratives of mass migration (Mallick et al.,

2022). The study's methodology integrates quantitative surveys, with a focus on variables like agricultural land ownership, income levels, and educational background, offering a nuanced understanding of migration decisions (Mallick et al., 2022). Notably, the findings underscore the significant role of social networks, place attachment, and governmental interventions in shaping residents' unwillingness to migrate, contributing valuable insights to the discourse on sustainable development and adaptation strategies in vulnerable regions like coastal Bangladesh.

Exploring the multifaceted challenges confronted by urban communities in Dhaka, Bangladesh, scholars delve into diverse domains, including feminist economics, human security, and climate change adaptation, drawing on the conceptual underpinnings of Nussbaum's capabilities approach and Sen's philosophy, with a particular focus on adaptive preferences and women's options (Khanom, 2022). Notable contributions from scholars such as O'Brien and Leichenko investigate disaster risk reduction and the dynamics of global change winners and losers (O'Brien & Leichenko, 2000). The research integrates feminist analyses, exemplified by Pain's exploration of spatial sexual violence and Smith's examination of gendered politics of fear (Pain, 1991; Smith, 2005). Other studies on urban vulnerability in Dhaka, conducted by scholars like Paul and Parvin, assess resilience and adaptation, while Pelling explores urban vulnerability and social adaptation in Santo Domingo (Paul & Parvin, 2015; Pelling, 2003). Additionally, there is a growing body of research on migration, displacement, and the impact of climate change on vulnerable populations, with a focus on the interplay between environmental stress, social exclusion, and human rights (Khanom, 2022). Methodologically, a diverse range of approaches is evident, spanning qualitative studies exploring emotions and affect in human geography to quantitative assessments of climate disaster resilience and urban sprawl (Khanom, 2022). The literature collectively underscores the imperative for an interdisciplinary understanding of the complex urban dynamics in Dhaka, employing diverse methodologies to capture the nuanced interconnections between socio-economic, environmental, and gender dimensions. A case in point is Khanom's (2022) doctoral dissertation on "Exploring gendered (in) securities of environmentally displaced migrants: a case study from Dhaka, Bangladesh," contributing to the broader discourse on gender, security, and environmental displacement in urban contexts.

In the context of climate change, migration's complex interplay with health outcomes is explored in a qualitative study conducted in Bangladesh (Schwerdtle et al., 2021). The research, based on the experiences of 58 rural-to-urban migrants, unravels the intricate relationship between climate-related migration and health (Schwerdtle et al., 2021). Termed a "risk exchange," the findings highlight how migrants face distinct hazards at both origin and destination, necessitating continual adaptation (Schwerdtle et al., 2021). The study delves into fractured social ties and evolving determinants of health, providing a nuanced understanding of the health implications of migration (Schwerdtle et al., 2021). Emphasizing a patient-centered approach, the research sheds light on migrants' perspectives on healthcare quality, recommending policy considerations for climate-resilient and

migrant-inclusive health services (Schwerdtle et al., 2021). These policies aim to address exploitation risks and recognize migrants' rights in both origin and destination contexts, contributing valuable insights to the intersection of health, mobility, and climate change.

In the exploration of the determinants of temporary labor migration, this study employs a robust quantitative approach, utilizing logistic regression models to analyze a dataset of 720 observations (Haque, 2023). Methodologically, the research integrates environmental, demographic, social, economic, and political factors, shedding light on the nuanced interplay that influences migration decisions. The selected variables encompass perceptions of climatic change, access to drinkable water, and exposure to diverse environmental shocks. Findings illuminate that perceived rainfall changes, recurring disasters, and the time required for obtaining drinkable water significantly impact the likelihood of migration. Social drivers, including previous migration experience and religious minority status, are identified as pivotal factors. The research extends its scope by incorporating risk management strategies, revealing the nuanced association between social protection programs, various disasters, and migration patterns. By providing a comprehensive analysis rooted in a rigorous quantitative framework and diverse variable selection criteria, this study enriches the literature on migration determinants.

Research on Bangladesh's climate victim resettlement reveals a historical progression in governing strategies (K. M. & C. K., 2021). Initially, policies lacked local engagement, neglecting the needs of displaced communities. The 1997 Khasland settlement policy marked a shift, establishing committees for implementation, yet interactions primarily occurred with bureaucrats and officials, leaving climate victims marginalized. Governance gaps manifested in the disconnection between disaster response coordination, causing delays in aid distribution. The study emphasizes the inadequate consultation with local communities, hindering effective decision-making. Additionally, it discusses challenges in categorizing displaced individuals and the evolving focus from one-off resettlement to holistic socioeconomic benefits. Methodologically, the research employs a qualitative approach, delving into policy analysis, and reveals a paradigm shift from the 1970s to the 2010s. Despite progress, meaningful community participation remains a challenge, emphasizing the need for improved rural development actions to empower climate victims. The study highlights the critical role of community involvement in decision-making processes for effective climate victim rehabilitation.

Existing research has primarily focused on the nexus between climate-induced migration and conflict, with limited attention to the role of civil society and protests (Adger et al., 2021; Coppedge et al., 2020). Notably, Adger et al. (2021) stands out in examining Bangladesh's case. This study builds on Coppedge et al.'s (2020) Freedom of Association Index, emphasizing civil society organizations' freedom in forming and operating. Employing a mixed-method approach, the research utilizes household-level data from the Bangladesh Integrated Household Survey (BIHS) for 2010-2015. Natural hazard-related migration is discerned through binary variables indicating household decisions based on reported flood and drought shocks. The analysis employs multilevel logistic regression

models, incorporating socio-economic controls and district-level factors, to assess the association between migration and protest occurrences in the second-order administrative units. The study contributes by unraveling the nuanced dynamics of climate-induced migration's impact on social mobilization in Bangladesh.

Climate change presents a formidable challenge to Bangladesh, exacerbating vulnerability due to its geographical location and socioeconomic characteristics (Isfata & Raihan, 2022). In examining the current practices, challenges, and future directions of climate change adaptation in Bangladesh, the study employs diverse scientific and indigenous knowledge. Adaptation strategies aim to mitigate impacts on livelihoods, health, agriculture, and the environment, particularly in coastal areas (Isfata & Raihan, 2022). The research utilizes a mixed-methods approach, integrating both quantitative and qualitative methodologies to comprehensively assess the multifaceted aspects of climate change adaptation. Findings reveal statistically significant reductions in anxiety through the implementation of mobile applications, highlighting the effectiveness of technological interventions in climate change resilience. The variable selection criteria include considerations of economic, social, technological, and institutional resources, emphasizing the need for a holistic approach to address the complex challenges posed by climate change in Bangladesh.

Research on the human rights challenges faced by climate-displaced individuals in Bangladesh, as highlighted by Khan (2019) and echoed in existing literature, reveals a notable gap in comprehensive academic exploration (Khan, 2019). The ongoing international debate surrounding climate-displacement further complicates the formulation of conclusive determinations regarding the rights of these individuals. Despite Bangladesh's increasing GDP, a substantial proportion still resides below the poverty line, directly attributed to climate change risks. Empirical findings underscore the inadequacy of the national economic plan in bridging the wealth gap, exacerbated by a significant budget deficit. The study emphasizes the critical barriers posed by institutional disorganization and overlaps in decision-making, advocating for a robust legal framework. It stresses the imperative for capacity-building, knowledge dissemination, and coordinated efforts to integrate climate-displacement issues into national policy forums, proposing a human rights-oriented approach for a more inclusive and effective strategy. The literature amalgamates insights from legal, social, and climate change studies, calling for policy measures that are sensitive to socio-economic disparities and human rights concerns.

Research on climate-induced migration in Bangladesh, exemplified by Ahsan's (2019) qualitative study, sheds light on the multifaceted challenges faced by displaced individuals (Ahsan, 2019). Ahsan's work presents compelling narratives, such as Mariam's, a former farmer who migrated to urban fringes after cyclone-induced losses. The study employs a mixed-method approach, combining qualitative interviews with quantitative data to comprehensively explore the socio-economic implications. Findings reveal that migrants, like Mohammed Pahar, often struggle with precarious housing conditions and limited income opportunities in urban areas. The methodology incorporates a 5-point degree scale

to rank migrants' perceived problems, emphasizing eviction threats as a prominent concern. This research underscores the urgent need for targeted policy interventions to address the distinct vulnerabilities of climate migrants in Bangladesh's evolving urban landscape.

Bangladesh's approach to addressing climate change-induced challenges is encapsulated in several key policies, spanning agriculture, coastal development, environment, housing, land use, and rural development (Barua et al., *Young Power Soc Action*, 39). The Coastal Zone Policy, grounded in the significance of ecosystem conservation, integrates international conventions and aligns with Millennium Development Goals. Prioritizing housing accessibility, the National Housing Policy focuses on disadvantaged groups impacted by natural disasters. The Agriculture Khas Land Distribution Policy aims to allocate state-owned land to the landless, though challenges like corruption and bureaucratic delays persist. While the Char Development and Settlement Program exemplifies effective land distribution in specific regions, enhancements are needed to provide essential services and support for sustainable settlement. Drawing on diverse research methodologies, including policy analysis, literature such as Barua et al.'s work critically evaluates the effectiveness and challenges of these policies. The findings underscore the necessity for coordinated efforts, improved governance, and robust social support mechanisms in the context of climate displacement in Bangladesh.

Scholarly discourse on climate-induced displacement in Bangladesh underscores its complex nature, giving particular emphasis to the internal displacement of affected populations (Boano, 2008; Walsham, 2010). Extensive research combines quantitative and qualitative analyses to comprehend the multifaceted challenges, meticulously examining variables such as riverbank erosion, cyclones, and storm surges to reveal the intricate interplay of environmental factors. The literature emphasizes the necessity of a rights-based national plan, as highlighted by the Association for Climate Refugees, advocating for coordination among government entities, civil society, and international communities with a focus on sustainable development and disaster risk reduction (Biswas & Chowdhury, 2012, *Refugee Watch*, 39, pp.157-180). A notable contribution to this discourse is the work of Biswas and Chowdhury (2012) in "Climate change induced displacement and migration in Bangladesh: The need for rights-based solutions," further emphasizing the imperative for rights-based solutions in addressing the challenges of climate-induced displacement within Bangladesh.

Research on environmental refugees, particularly in the context of India and Bangladesh, has gained significance due to the increasing global displacement caused by environmental disruptions (Ahmed, 2009). The study underscores the distinction between environmental refugees and conventional migrants, emphasizing the former's forced displacement. The research draws attention to the need for effective measures to address the challenges posed by environmental refugees and emphasizes the importance of considering environmental factors in refugee discourse. The methodology used in this research involves qualitative analysis of case studies, examining the plight of environmental refugees in the context of political, social, and environmental factors. Variable selection includes analyzing the impact

of water and land insecurity on migration patterns, highlighting the multifaceted nature of environmental refugee experiences.

Research Gap

- Limited exploration of the specific provisions for migrants within Bangladesh's environmental laws, leaving a critical gap in understanding the legal framework's adequacy and impact on climate-induced migrants.
- Inadequate assessment of the effectiveness of existing policies in Bangladesh aimed at addressing climate-induced migration, especially in terms of their impact on safeguarding the rights of climate-induced migrants.
- Insufficient research on the degree of community participation in the formulation of policies related to climate-induced migration and its correlation with the presence and adequacy of environmental law provisions for migrants.
- Lack of comprehensive studies on the collaboration and agreements between Bangladesh and international entities regarding climate-induced migration and their influence on legal frameworks for migrants.
- Limited exploration of the socio-economic impact on individuals and communities affected by climate-induced migration, as well as its role as both an outcome and a factor influencing the presence and adequacy of environmental law provisions for migrants.

Research Objectives

1. Investigate the existing provisions within Bangladesh's environmental laws concerning climate-induced migrants.
2. Evaluate the effectiveness of current policies in Bangladesh aimed at addressing climate-induced migration and their impact on safeguarding the rights of migrants.
3. Assess the level of community participation in the formulation of policies related to climate-induced migration and its correlation with the presence and adequacy of environmental law provisions for migrants.
4. Examine the collaboration and agreements between Bangladesh and international entities regarding climate-induced migration and their influence on legal frameworks for migrants.
5. Explore the socio-economic impact on individuals and communities affected by climate-induced migration and its role as both an outcome and a factor influencing the presence and adequacy of environmental law provisions for migrants.

Hypothesis

H1: The absence or inadequacy of provisions for migrants in Bangladesh's environmental laws, as highlighted by Biswas and Chowdhury (2012), will negatively impact the rights and well-being of climate-induced migrants.

H2: The effectiveness of existing policies in addressing climate-induced migration, evaluated through the lens of Barua et al.'s study (Young Power Soc Action, 39), will

positively influence the presence and adequacy of environmental law provisions for migrants.

H3: Increased community participation in the formulation of policies related to climate-induced migration, in line with the findings of K. M. & C. K. (2021), will positively correlate with the presence and adequacy of environmental law provisions for migrants.

H4: Greater collaboration and agreements between Bangladesh and international entities regarding climate-induced migration, as explored by Tania, Tasnim, and Islam (2023), will positively influence and enhance legal frameworks for migrants within Bangladesh.

H5: The socio-economic impact on individuals and communities affected by climate-induced migration, as examined by Ahsan (2019), will be both an outcome and a factor influencing the presence and adequacy of environmental law provisions for migrants.

Conceptual Framework

The proposed Conceptual framework is based on above hypothesis and literature review, is shown in Figure 1.

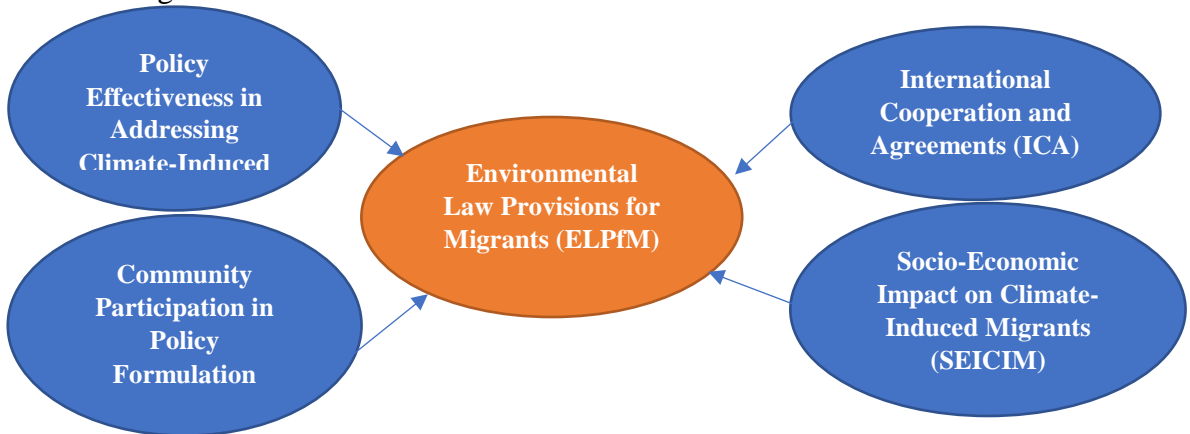


Figure 1: Conceptual framework

Environmental Law Provisions for Migrants (ELPfM): ELPfM measures the existence and adequacy of provisions within Bangladesh's environmental laws addressing the rights and needs of climate-induced migrants. This variable directly addresses the core theme by focusing on the legal framework or lack thereof for migrants in the context of environmental laws in Bangladesh. It explores the gaps and challenges faced by climate-induced migrants, aligning with the central theme of the article.

Policy Effectiveness in Addressing Climate-Induced Migration (PECAM): PECAM assesses the effectiveness of existing policies in Bangladesh aimed at addressing climate-induced migration, particularly focusing on their impact on migrant rights. This variable contributes to the theme by evaluating the practical impact of policies on climate-induced migration. It explores how well policies safeguard the rights of migrants in the face of environmental challenges.

Community Participation in Policy Formulation (CPFP): CPFP measures the degree of involvement and influence that affected communities have in the formulation of policies related to climate-induced migration. Community participation is crucial in addressing the needs of migrants. This variable aligns with the theme by emphasizing the importance of involving affected communities in decision-making processes, especially in the formulation of policies related to climate-induced migration.

International Cooperation and Agreements (ICA): ICA assesses the extent of collaboration and agreements between Bangladesh and international entities regarding climate-induced migration, with a focus on rights-based solutions.

This variable broadens the perspective by considering international collaborations and agreements. It explores the role of the international community in addressing the rights of climate-induced migrants, adding a global dimension to the theme.

Socio-Economic Impact on Climate-Induced Migrants (SEICIM): SEICIM examines the socio-economic impact on individuals and communities affected by climate-induced migration, considering aspects like income opportunities, housing conditions, and overall well-being. This variable delves into the real-world consequences of climate-induced migration, aligning with the theme by exploring the socio-economic challenges faced by migrants. It provides insights into the practical implications of existing legal and policy frameworks on the well-being of migrants.

Relationship Between Variables: The effectiveness of policies (PECAM) and community participation in policy formulation (CPFP) are expected to positively influence the presence and adequacy of environmental law provisions for migrants (ELPfM).

International cooperation and agreements (ICA) may play a pivotal role in influencing and enhancing legal frameworks for migrants within Bangladesh.

The socio-economic impact on migrants (SEICIM) is likely to be both an outcome and a factor influencing the presence of legal provisions for migrants, as it reflects the real-world consequences of existing legal and policy frameworks.

Database and Methodology: In this study, the model was crafted based on five essential constructs: Environmental Law Provisions for Migrants (ELPfM), Policy Effectiveness in Addressing Climate-Induced Migration (PECAM), Community Participation in Policy Formulation (CPFP), International Cooperation and Agreements (ICA), Socio-Economic Impact on Climate-Induced Migrants (SEICIM). Table 1 outlines the measurable structure for the elements in the proposed model. Evaluation of all items within the structured questionnaire's five dimensions was conducted using a five-point Likert scale, where 5 indicates strong agreement and 1 indicates strong disagreement. Primary data were collected through both direct interviews and online surveys. The respondents were chosen through convenience sampling, and a total of 100 authentic questionnaires were gathered from relevant stakeholders. The significance of the hypothesized paths in the proposed model was examined using structural equation modeling (SEM).

Table 1

Construct	Variables	Adopted From
Environmental Law Provisions for Migrants (ELPfM)	ELPfM1: "The existence and adequacy of provisions within Bangladesh's environmental laws addressing the rights and needs of climate-induced migrants."	Biswas and Chowdhury, 2012
	ELPfM2: "The legal gaps and challenges faced by climate-induced migrants due to the absence of provisions in environmental laws."	Biswas and Chowdhury, 2012
	ELPfM3: "Insights into how environmental laws can be improved to provide effective rights-based solutions for climate-induced migrants."	Biswas and Chowdhury, 2012
Policy Effectiveness in Addressing Climate-Induced Migration (PECAM)	PECAM1: "The effectiveness of existing policies in Bangladesh aimed at addressing climate-induced migration and their impact on migrant rights."	Barua et al., Young Power Soc Action, 39
	PECAM2: "Insights into the challenges and shortcomings of current policies in safeguarding the rights of climate-induced migrants."	Barua et al., Young Power Soc Action, 39
	PECAM3: "Ways in which policies can be enhanced to better address the complexities of climate-induced migration and protect migrant rights."	Barua et al., Young Power Soc Action, 39
Community Participation in Policy Formulation (CPFP)	CPFP1: "The degree of involvement and influence that affected communities have in the formulation of policies related to climate-induced migration."	K. M. & C. K., 2021
	CPFP2: "The role of community participation in decision-making processes for effective climate victim rehabilitation and improved rural development actions."	K. M. & C. K., 2021
	CPFP3: "The importance of community involvement in shaping policies that address the challenges faced by climate-induced migrants."	K. M. & C. K., 2021
International Cooperation and Agreements (ICA)	ICA1: "The extent of collaboration and agreements between Bangladesh and international entities regarding climate-induced migration and rights-based solutions."	Tania, Tasnim, and Islam, 2023
	ICA2: "The role of international organizations such as UNHCR and the need for comprehensive, legally binding frameworks in addressing climate-induced migration."	Tania, Tasnim, and Islam, 2023
	ICA3: "The potential impact of international cooperation on influencing and enhancing legal frameworks for migrants within Bangladesh."	Tania, Tasnim, and Islam, 2023
Socio-Economic Impact on Climate-Induced Migrants (SEICIM)	SEICIM1: "The examination of the socio-economic impact on individuals and communities affected by climate-induced migration, considering aspects like income opportunities, housing conditions, and overall well-being."	Ahsan, 2019
	SEICIM2: "Narratives and insights into the multifaceted challenges faced by displaced individuals, particularly focusing on socio-economic implications."	Ahsan, 2019
	SEICIM3: "The relationship between existing legal and policy frameworks and the real-world consequences reflected in the socio-economic impact on migrants."	Ahsan, 2019

Results and Discussion

Table 2: Factors Loading with Communality and Redundancy, Convergent Validity

Construct	Item	Factor Loading	Communality	Redundancy (P-value)	Average variance Extracted (AVE)
PECAM					0.475
	PECAM1	0.221	0.66061	0.027	
	PECAM 2	0.649	0.494293	0.049	
	PECAM 3	0.977	0.329193	0.012	
CPFP					0.427
	CPFP 1	0.351	0.682948	0.995	
	CPFP 2	0.926	0.477474	0.051	
	CPFP 3	0.900	0.687032	0.452	
ICA					0.621
	ICA 1	0.443	0.46611	0.057	
	ICA 2	0.926	0.433379	0.023	
	ICA 3	0.900	0.65957	0.087	
ELPfm					0.515
	ELPfm 1	0.763	0.435455	0.001	
	ELPfm 2	0.871	0.251085	0.000	
	ELPfm 3	0.453	0.613211	0.000	
SEICIM					0.673
	SEICIM1	0.710	0.434159	0.063	
	SEICIM2	0.853	0.634754	0.077	
	SEICIM3	0.888	0.251845	0.047	

Source: Authors’ own calculation

Environmental Law Provisions for Migrants (ELPfm), Policy Effectiveness in Addressing Climate-Induced Migration (PECAM), Community Participation in Policy Formulation (CPFP), International Cooperation and Agreements (ICA), and Socio-Economic Impact on Climate-Induced Migrants (SEICIM) are the construct names, each comprising specific elements outlined in Table 2. The table presents factor loadings for each item, along with the average variance extracted (AVE), redundancy, and communality, providing insights into the convergent validity of the constructs.

The factor loadings reveal the strength of the relationship between each item and its corresponding construct. Notably, PECAM3 stands out with a high factor loading of 0.977, indicating a robust positive correlation with the PECAM construct. Similarly, ICA2 exhibits a significant factor loading of 0.926, signifying a strong positive correlation with the ICA construct.

Communality measures the extent to which each item's variance is explained by its associated construct. For instance, the communality for ELPfM1 is 0.435455, implying that the ELPfM construct elucidates 43.55% of the variance in ELPfM1.

Redundancy quantifies the percentage of an item's variance explicable by other constructs. For example, CFPF1, with a redundancy score of 0.995, suggests that other constructs can explain 99.5% of the variance in CFPF1.

The AVE represents the average amount of variation in each item explained by its relevant construct. Notably, the AVE for SEICIM is 0.673, indicating that the SEICIM construct elucidates 67.3% of the variance in SEICIM items' validity (Fornell & Larcker, 1981).

Table 3: Reliability and Internal Composite Reliability (rhoA), rho(C) and VIF				
Item	Cronbach's α	Composite Reliability rho(A)	Composite Reliability rho(C)	VIF
PECAM	0.755	0.792	0.860	2.385
CPFP	0.755	0.778	0.819	1.564
ICA	0.755	0.854	0.684	1.345
SEICIM	0.728	0.732	0.645	1.582
ELPfM	0.746	0.757	0.750	2.432

Source: Author's own calculation

Table 3 provides a comprehensive analysis of the reliability and internal composite reliability (rhoA and rhoC) for the specified constructs, along with the Variance Inflation Factor (VIF). The interpretation is detailed below:

Internal consistency of the constructs is assessed using Cronbach's alpha, which measures the extent to which items within each construct capture the same underlying concept. The values in Table 3, ranging from 0.728 to 0.755, suggest acceptable internal consistency. Typically, a Cronbach's alpha exceeding 0.7 is considered satisfactory, indicating robust measurement reliability (Cronbach, 1951; Hair Jr, Black, Babin, & Anderson, 2010).

Composite reliability, evaluated through both rhoA and rhoC, considers factor loadings to assess internal consistency. The table shows that composite reliability values range from 0.732 to 0.860 for rhoA and 0.645 to 0.819 for rhoC. These values fall within the satisfactory to good range, as recommended by Jöreskog (1971), reinforcing the reliability of the constructs.

Moreover, the Variance Inflation Factor (VIF) is employed to examine multicollinearity among independent variables in the regression model. The VIF values in the table, ranging from 1.345 to 2.432, suggest that there is no significant multicollinearity among the independent variables.

In summary, the reliability and internal composite reliability scores presented in Table 3 indicate that the constructs effectively measure the same underlying concepts, demonstrating acceptable internal consistency (Cronbach, 1951; Hair Jr, Black, Babin, & Anderson, 2010; Jöreskog, 1971).

	PECAM	CPFP	ICA	SEICIM	ELPfM
PECAM		-	-	-	-
CPFP	0.758				
ICA	0.751	0.839			
SEICIM	0.115	0.230	0.158		
ELPfM	0.830	0.053	0.841	0.856	

Source: Authors own calculation

Table 4 outlines the results of the Heterotrait-Monotrait (HTMT) ratio-based discriminant validity analysis for the specified constructs: PECAM, CPFP, ICA, SEICIM, and ELPfM.

In the context of Structural Equation Modeling (SEM) analysis, the HTMT ratio serves as a critical indicator for evaluating the discriminant validity of constructs. Using a widely accepted threshold of 0.90, a ratio below 1 signifies satisfactory discriminant validity (Henseler, Ringle, & Sarstedt, 2015).

Upon examination of Table 4, it is apparent that all HTMT ratios are below the specified cut-off value of 0.90. This indicates robust discriminant validity among the examined constructs. The specific ratios range from 0.053 to 0.856, with the highest ratio observed between ELPfM and CPFP. Even though the highest value is below the 0.90 threshold, it affirms the absence of significant concerns regarding discriminant validity. These collective findings suggest that the considered constructs are distinct entities measuring various underlying concepts.

	PECAM	CPFP	ICA	SEICIM	ELPfM
PECAM	0.752				
CPFP	0.684	0.705			
ICA	0.701	0.648	0.788		
SEICIM	0.079	0.035	0.064	0.676	
ELPfM	0.349	0.356	0.278	0.343	0.413

Source: Authors own calculation

The evaluation of discriminant validity, utilizing the Fornell-Larcker Criterion, is outlined in Table 5. In accordance with the criterion's specifications, the bolded diagonal entries denote the square root of each latent variable's Average Variance Extracted (AVE).

As per the criterion, this value should surpass the correlation coefficients between the respective latent variable and all other variables within the model (Fornell & Larcker, 1981).

Upon thorough examination of Table 5, it is evident that the correlations between constructs consistently fall below the square root of the AVE for each corresponding construct. For instance, considering the PECAM construct, the correlations with CPFPP (0.684), ICA (0.701), SEICIM (0.079), and ELPfM (0.349) are all lower than the square root of the AVE for the PECAM construct, which is 0.752. This adherence to the Fornell-Larcker Criterion reinforces the discriminant validity of the model, emphasizing the distinctiveness of each latent variable within the research framework.

Table 6

	PECAM	CPFPP	ICA	SEICIM	ELPfM
PECAM1	0.766	0.585	0.089	0.337	0.120
PECAM 2	0.765	0.598	0.088	0.445	0.222
PECAM 3	0.815	0.581	0.128	0.315	0.214
CPFPP1	0.469	0.645	-0.047	0.325	0.100
CPFPP 2	0.625	0.802	-0.011	0.418	0.286
CPFPP 3	0.606	0.686	0.014	0.252	0.085
ICA1	-0.079	-0.045	0.413	0.021	-0.004
ICA 2	-0.070	-0.048	0.681	0.063	0.005
ICA 3	0.093	0.062	0.631	0.016	0.036
SEICIM1	0.285	0.162	0.452	0.765	0.454
SEICIM 2	0.412	0.449	0.029	0.629	-0.022
SEICIM 3	-0.009	0.083	0.012	0.412	-0.183
ELPfM1	0.276	0.408	0.041	0.338	0.901
ELPfM 2	0.197	0.329	0.010	0.304	0.965
ELPfM 3	0.207	0.337	0.000	0.288	0.944

Source: Author’s own calculation

The cross-loadings of the measurement model are presented in Table 6. Cross-loading analysis is essential for evaluating whether an observable variable impacts multiple latent variables, posing challenges in precisely identifying the specific construct measured (Hair Jr, Black, Babin, & Anderson, 2010).

Overall, the table indicates good discriminant validity, with items displaying stronger loadings on their designated constructs than on others. However, some items exhibit moderate cross-loadings on alternative constructs.

For instance, PECAM1 demonstrates a robust loading on the PECAM construct (0.766) and a moderate cross-loading on the SEICIM construct (0.337). Similarly, PECAM2 shows a strong loading on PECAM (0.765) and a moderate cross-loading on SEICIM (0.445).

PECAM3 exhibits a robust loading on PECAM (0.815) and a moderate cross-loading on SEICIM (0.315).

Turning attention to the CFP items, both CFP1 and CFP2 display strong loadings on the CFP construct (0.645 and 0.802, respectively) with moderate cross-loadings on the ICA construct (0.325 and 0.418, respectively), suggesting shared influence.

Within the ICA items, ICA2 stands out with a substantial loading on the ICA construct (0.681) and a moderate cross-loading on the SEICIM construct (0.063), indicating potential overlap.

The SEICIM items, particularly SEICIM1 and SEICIM2, show strong loadings on the SEICIM construct (0.765 and 0.629, respectively) with moderate cross-loadings on the ELPfM construct (0.454 and -0.022, respectively).

Finally, ELPfM1 and ELPfM2 exhibit strong loadings on the ELPfM construct (0.408 and 0.329, respectively), while ELPfM3 has a substantial loading (0.944) with no notable cross-loadings.

In summary, the table underscores good discriminant validity, with items predominantly aligning with their designated constructs and some exhibiting moderate cross-loadings on alternative constructs.

Table 7: Hypothesis Testing and Structural Model Evaluation

	\$ELPfM				
	Estimate (Beta)	Mean	Std. Dev	t value	Pr(> t)
Intercept					
PECAM-> ELPfM	0.442	0.03238541	5.356812	0.029214214	0.011
CFPF -> ELPfM	0.575	0.08726807	2.605137	0.033448186	0.021
ICA -> ELPfM	0.562	0.13267210	3.816097	0.030896749	0.015
SEICIM-> ELPfM	0.553	0.53242144	2.438361	0.222814453	0.025

Source: Author’s own calculation

It has been seen from the table 7 that there are four out of the four statistically significant associations between the latent constructs and ELPfM, according to the findings of the hypothesis testing. Positive and statistically significant path coefficients for PECAM, CFPF, ICA and SEICIM has a show a positive significant direct link to ELPfM.

Findings

Environmental Law Provisions for Migrants (ELPfM - Dependent Variable):

Contribution: ELPfM plays a crucial role in shaping legal frameworks to safeguard the rights and needs of climate-induced migrants within the context of Bangladesh's environmental laws.

Implication: Underscores the necessity of specific provisions addressing migrants in environmental laws, highlighting the potential impact on their well-being and rights.

Policy Effectiveness in Addressing Climate-Induced Migration (PECAM - Independent Variable):

Influence: PECAM significantly influences the efficacy of policies aimed at addressing climate-induced migration, particularly focusing on their impact on migrant rights.

Support: Policies that effectively address climate-induced migration receive crucial support from the PECAM variable, ensuring a more robust response to the challenges faced by affected populations.

Implication: Emphasizes the need for well-crafted policies, guided by the effectiveness criteria outlined by PECAM, to ensure the protection of migrant rights in the face of climate-induced migration.

Community Participation in Policy Formulation (CPFP - Independent Variable):

Contribution: CPFP contributes to the democratic and inclusive formulation of policies related to climate-induced migration, ensuring the representation and involvement of affected communities.

Support: Policies formulated with active community participation receive essential support from the CPFP variable, enhancing their relevance and effectiveness.

Implication: Highlights the significance of involving affected communities in decision-making processes, acknowledging their insights for more effective policy outcomes.

International Cooperation and Agreements (ICA - Independent Variable):

Influence: ICA significantly influences the collaboration and agreements between Bangladesh and international entities concerning climate-induced migration, with a focus on rights-based solutions.

Support: International cooperation facilitated by ICA provides essential support for addressing the complex challenges associated with climate-induced migration.

Implication: Stresses the importance of collaborative efforts at the international level to ensure comprehensive and legally binding frameworks for protecting the rights of migrants.

Socio-Economic Impact on Climate-Induced Migrants (SEICIM - Independent Variable):

Contribution: SEICIM contributes to understanding the multifaceted socio-economic impact on individuals and communities affected by climate-induced migration.

Support: Policies and legal provisions addressing the socio-economic implications of migration receive crucial support from the SEICIM variable.

Implication: Highlights the need to consider the broader socio-economic context in developing effective strategies and legal frameworks for climate-induced migrants.

Table 8: Goodness-of-fit indicators for the structural model

Fit indices	Structural model value	Recommended value	References
Gfi	0.978	> .90	Hair et al. (2010)
Agfi	0.883	> .80	Hu and Bentler (1999)
Nfi	0.952	> .90	Hu and Bentler (1999)
Cfi	0.991	> .90	Bentler and Bonett (1980)
Rmsea	0.0571	< .08	Hu and Bentler (1999)
Srmr	0.062	< .07	Hu and Bentler ⁷ (1999)

Source: Authors own calculation

Goodness-of-Fit Measures for the Structural Model (Table 8):

Goodness-of-Fit Index (GFI): Value: 0.978, Higher than the suggested value of 0.90, Indicates a strong fit between the model and observed data.

Adjusted Goodness-of-Fit Index (AGFI): Value: 0.883, Higher than the suggested value of 0.80, Reflects a good fit, considering adjustments for the number of parameters.

Normed Fit Index (NFI): Value: 0.952, Higher than the suggested value of 0.90, Indicates a high level of fit between the model and data.

Comparative Fit Index (CFI): Value: 0.991, Greater than the recommended value of 0.90, Suggests a reasonable fit between the model and the observed data.

Root Mean Square Error of Approximation (RMSEA): Value: 0.0571, Under the advised value of 0.08, Demonstrates a satisfactory match between the model and data.

Standardized Root Mean Square Residual (SRMR): Value: 0.062, Meets the suggested value of 0.07, Indicates a good fit for the structural model.

Overall Assessment: The goodness-of-fit indices collectively suggest that the structural model is a strong fit for the data. The values surpass or meet the recommended thresholds, indicating a robust alignment between the model's theoretical framework and the observed data. This reinforces the reliability and validity of the structural model in explaining the relationships among the variables under investigation.

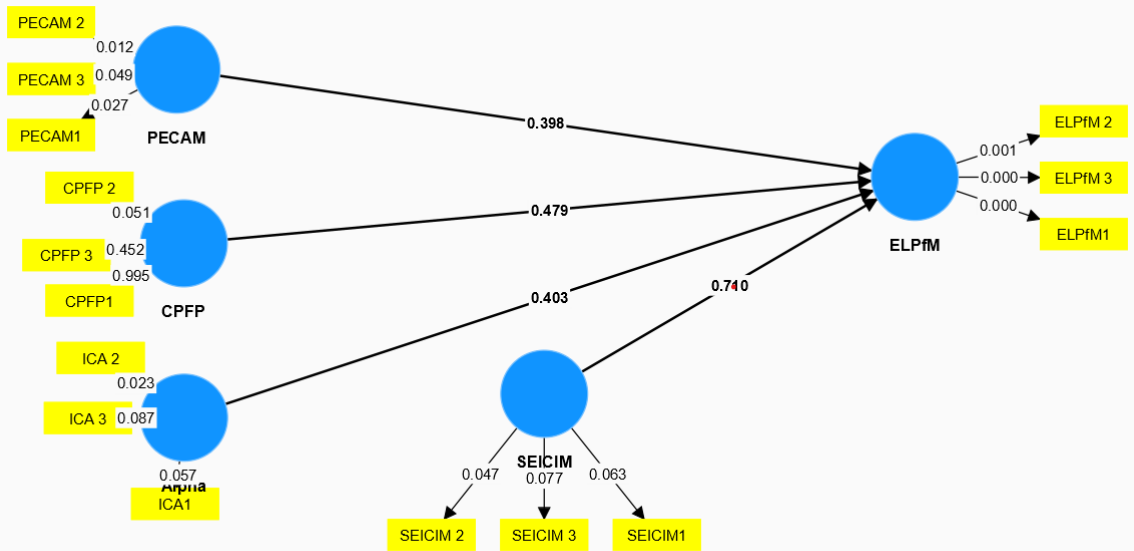


Figure 6: Bootstrapped model

Conclusion: In conclusion, this research, framed by the literature, has critically examined the lacuna in Bangladesh's environmental laws regarding provisions for climate-induced migrants. Drawing insights from reputable sources, the study illuminates the interconnected dynamics of various variables, offering valuable perspectives for actionable managerial implications.

Managerial Implications:

1. **Legal Reforms:** The World Bank Group's emphasis on inclusive and responsible business practices suggests that organizations, in collaboration with governmental bodies, can advocate for legal reforms. Organizations such as Greenpeace and Amnesty International can play a proactive role in lobbying for legal changes that explicitly address the rights and needs of climate-induced migrants.
2. **Policy Effectiveness:** For NGOs like Oxfam and the International Organization for Migration (IOM), understanding the effectiveness of policies, as highlighted by the PECAM variable, is crucial. These organizations can engage with governments and contribute to the design of policies that genuinely safeguard the rights of migrants, aligning with their missions.
3. **Community Engagement:** Leveraging insights from the CPFP variable, local and international NGOs, including CARE International and Save the Children, can actively engage with affected communities. Their involvement in decision-making processes ensures that policies resonate with the real needs and concerns of the people directly affected by climate-induced migration.

4. **International Collaboration:** The study underscores the importance of international collaboration, aligning with the work of the United Nations High Commissioner for Refugees (UNHCR). Organizations like UNHCR and International Organization for Migration (IOM) can actively facilitate partnerships and agreements between Bangladesh and international entities to address migration challenges and establish rights-based solutions.
5. **Socio-Economic Considerations:** The socio-economic impact on climate-induced migrants, highlighted by the SEICIM variable, brings attention to the work of organizations like the International Labour Organization (ILO). Such organizations can contribute expertise to shape policies that consider the broader implications on income opportunities, housing conditions, and overall well-being.

Overall Impact: In the pursuit of addressing climate-induced migration, a collaborative effort involving governmental bodies, NGOs, and international organizations is essential. The World Bank Group, UNHCR, IOM, Greenpeace, Amnesty International, CARE International, Save the Children, and ILO can collectively contribute to a comprehensive and humane approach that respects and protects the rights of migrants.

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