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Navigating Climate-Induced Migration in Kerala: Challenges, Responses, and Adaptation Strategies

| Neha Maria Benny



Discussion Paper

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NOVEMBER 2023

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ABSTRACT

This article delves into the intricate web of climate-induced migration in the Indian state of Kerala, offering insights into the causes, impacts, and policy responses surrounding the issue. The potential effects of rising temperatures, erratic precipitation patterns, rising sea levels, and more frequent extreme weather events result in population displacement and internal migration. Kerala's vulnerability to these climate-related disasters, such as floods and coastal erosion, has disproportionately affected impoverished and vulnerable communities, triggering internal migration within the state.

The article discusses the need for a dedicated policy framework that explicitly recognizes climate-induced migration, underlines the significance of data collection and research to understand migration dynamics, emphasises the identification and support of vulnerable groups within migrant populations, and calls for strengthening disaster preparedness and climate resilience measures. It advocates for the involvement of affected communities in resettlement initiatives and underscores the importance of proactive national and local policies to plan for the managed retreat of coastal populations at risk from rising sea levels. Kerala's experience with climate-induced migration serves as a valuable case study for other regions grappling with similar challenges in an ever-changing global climate landscape.

INTRODUCTION

The undeniable impact of anthropogenic¹ activities on unprecedented climate change, leading to higher temperatures, erratic precipitation patterns, rising sea levels, and more frequent extreme weather events is now globally acknowledged. (McLeman & Smit, 2006). This has spurred discussions on displacement and migration caused by climate-related factors. While there is no universally accepted definition of climate-induced migration, it generally refers to people moving due to sudden or progressive changes in climate (Rajan et al., 2022).

In 1992, the International Organization for Migration highlighted the role of environmental degradation in migration, a trend expected to escalate with climate change (Laczko et al., 2009). While migration has been extensively studied and theorised, environmental factors have not received much attention within mainstream migration theory. Since migration is influenced by various factors, economic, social, and political, it is challenging to establish a direct causal link between migration and climate change and environmental aspects remain underrepresented (Jennath & Paul, 2022). However, given its impact in urbanisation and cultural exchange, it is imperative to consider environmental factors in this context.

Climate-induced migration differs from economic migration in terms of the urgency of decisions, limited destination knowledge, and low expectations of improved quality of life (Ahsan et al., 2014). The extent to which the environment or climate change drives migration varies across different regions and populations (Hunter et al., 2015). This relationship depends on the vulnerability of areas and communities, which are shaped by their exposure, sensitivity, and capacity to adapt to environmental stressors (McLeman & Smit, 2006). Climate change may not directly force people to leave their homes or migrate. Instead, it may generate environmental impacts and amplify existing vulnerabilities, making it challenging for people to continue living in their current locations. The anticipated consequences of climate change are likely to lead to additional population displacements.

Climate-induced migration sets off a cascade effect: individuals affected by climate disasters migrate to cities, causing an oversupply of low-wage urban workers. This depresses urban wages, prompting a secondary migration from smaller to larger urban areas. While climate events indirectly contribute to this, these migrants are mainly considered economic migrants. Whether migration patterns change due to climate change hinges on community adaptation and household strategies. If communities adapt effectively, migration patterns may remain stable. However, struggling communities may prompt households to consider migration as an option, potentially altering community dynamics and demographics. Communities can also become destinations for migrants facing environmental challenges, creating feedback loops (McLeman & Smit, 2006).

Migration offers individuals and communities a means to adapt to livelihood shifts and environmental changes. Remittances play a crucial role in adaptation, assisting households in their places of origin (Deshingkar 2012). Migration can be either a planned adaptation strategy or a last resort, depending on circumstances (Adams, 2016). It may result in two categories of immobile populations: involuntary non-migrants (trapped populations) lacking means to leave high-risk areas, and voluntary non-migrants due to factors such as proximity to work, value of inheritance property, emotional attachment etc, as observed in places like Genuk, Indonesia

1 relating to, or resulting from the influence of human beings on nature (Merriam-Webster, n.d.)

(Buchori et al., 2018). In the case of voluntary non-migrants, individuals and households also choose to stay in their current locations, even when there are apparent economic incentives to move or when they face environmental hazards or long-term environmental transformations. These responses are influenced by individual characteristics and a multitude of factors at different levels. Vulnerable lower-income groups face resource limitations for migration, influenced by risk exposure and adaptive capacity (Jennath & Paul, 2022).

The following essay seeks to contribute to the vast scholarship in examining specific aspects of climate-related migration such as its duration, destination, and composition; here it is explained in the specific context of the Indian state of Kerala. The Kerala State Action Plan on Climate Change has noted rising district-wise rainfall trends in the pre-monsoon, monsoon, and winter seasons, including an anticipated surge in extremely heavy rainfall across all districts. This aligns with established research findings on temperature shifts, rainfall alterations, and heightened occurrences of extreme weather events like heat waves, heavy precipitation, droughts, and tropical cyclones, both globally and at regional and national levels (Sivaramakrishnan, n.d.).

The districts of Wayanad, Kozhikode, Kasaragod, Palakkad, Alappuzha, Idukki, Kannur, Malappuram, and Kollam in Kerala have been identified as highly vulnerable. These districts face multiple challenges, including a high prevalence of diseases, a significant population of very young, elderly, and differently-abled individuals. They also have limited access to health-care facilities and relief shelters, insufficient irrigation coverage, and poor quality of groundwater and surface water (DoECC, 2023). Due to rising sea levels attributed to Antarctic ice melt, central Kerala, which is already experiencing unprecedented and intense rainfall, will face the most significant consequences. Projections indicate that by 2050, four districts, including substantial areas of Ernakulam, Kottayam, and Alappuzha, along with certain parts of Thrissur, may find themselves below sea level (Nambudiri, 2023). Climate change-induced migration is thus likely to increase in Kerala—citing the example of Munroe Island in Kerala, which was the first island to become uninhabitable due to rising sea levels.

To understand how climate vulnerability relates to migration, it is essential to investigate the factors influencing migration in environmentally stressed regions and why some individuals opt to stay despite the difficulties. These insights can be invaluable for the success of resettlement efforts.

a) Climate Change in Kerala

The coastal stretch of Kerala, spanning 590 kilometres along the Arabian Sea, is one of the most densely populated regions in the country (860 people per square kilometre) (Menon et al., 2014). The Kerala coastline frequently faces high-impact events such as rogue waves, storm surges and tsunamis leading to extensive erosion, which over the period between 2002-2012 alone led to the loss of approximately 500 hectares of coastal land and affected approximately 79,000 people (S. and Kuriakose, 2014). In recent years, Kerala has been confronted with a series of natural disasters, including cyclone Ockhi in 2017 and severe floods in 2018 - 2019. There are 39 identified hazards, including natural and anthropogenic ones, making the state particularly vulnerable to disasters due to its high population density. Among these hazards, floods are the most common, affecting nearly 14.5% of the state's land area, with some districts facing even higher risks, up to 50% (UNDP, 2018). In 2018, Kerala expe-

rienced its worst flood event in decades, with cumulative rainfall during June 1 to August 18 exceeding the normal average by 42%. This led to over 410 fatalities and the displacement of thousands. The floods impacted about 5.4 million people, forcing nearly 1.4 million into relief camps, while many sought shelter with friends and relatives. Despite immediate disaster response efforts, the floods inflicted extensive damage on infrastructure and livelihoods, with many still working to rebuild today (UNDP, 2018). Coastal erosion and turbulent seas are now regularly bringing significant distress to the lives of residents in coastal areas (Balagopalan, 2021).

b) Migration Patterns in Kerala: Linking Climate Change and Migration

Kerala exhibits unique paradoxes: strong human development indicators despite economic challenges, limited industrial growth but high living standards, low per capita income but elevated consumption, and minimal poverty despite rural-urban income inequality (Zachariah et al., 2003). Kerala has a long history of semi-skilled and skilled migration and labour migration is a key element of Kerala's economy, leading to a remittance-driven structure, with Keralites often sending money home to support their families. (Rajan et al., 2020) Climate-related migration can be distinguished from economic migrants by several key factors: the haste of their decisions, limited knowledge about where to migrate, and low expectations about an improved quality of life in the new destination (Ahsan et al., 2014).

In 2021, nearly 5 million people in India were internally displaced due to climate change and disasters, according to the UNHCR's Global Trends Report. These climate migrants often lack official refugee status and struggle to survive. (Bose, 2023) There are two types of climate-induced migration: rapid onset events like floods and cyclones and slow onset events like sea-level rise and desertification. Slow-onset events lead to distress migration, where people move in anticipation of impending environmental adversity. This type of migration can result in distress, discrimination and loss of cultural identity in urban areas. (Bose, 2023)

The National Centre for Sustainable Coastal Management (NCSCM) states that a significant stretch of Kerala's coastline (63 percent) is eroding, with Thiruvananthapuram district experiencing the highest erosion rates. The erosion in Valiyathura, Poonthura, and Panathura beaches appears to be progressive, with Cyclone Ockhi in 2017 exacerbating the situation. Fisher families who lost their homes in Valiyathura during Cyclone Okhi and heavy erosion in the past years are living in camps or rented dwellings. The government has offered compensation of Rs 10 lakh per family for purchasing land and constructing houses, but the displaced villagers find this insufficient and want safe housing constructed in their locality. The displaced villagers have lost their jobs and livelihoods due to reduced access to the sea, and they live in unhealthy conditions with threats of mosquito-borne diseases and snakes (Bhavapriya, 2021).

In Munroe Islands, due to the rising sea levels, homes are inundated during high tide periods, and unlike the past, the water remains for many months. Nearly 39 percent of the island's land area is already submerged by water. Over 800 families have already abandoned their submerged properties here; throughout the region, abandoned houses stand as submerged skeletons. They represent Kerala's first climate change migrants. Munroe Island's remaining residents are now grappling with various climate-related survival challenges, including ongoing land subsidence, tidal flooding, and reduced agricultural productivity. Even tourism

facilities are being submerged by rising sea waters from the Arabian Sea via the Ashtamudi Lake (Shaji, 2023).

Kuttanad, known for its backwaters and paddy cultivation in Kerala, is also witnessing an exodus due to climate change and poorly planned development. Post 2018 there has been more frequent and severe flooding in the region. In the fear of annual floods and rising sea levels, over 6,000 families have abandoned their properties in the last two years, according to government estimates. Climate change is a major factor in this crisis, but residents also blame poorly planned infrastructure and rapid development, including tourism resorts and infrastructure on fragile reclaimed land (Shaji & Mazumder, 2021).

In a recent study by Jennath and Paul (2022), a two-phase migration pattern has been observed in their sample of individuals affected by climate change in Kerala, along five coastal districts. Initially, the majority of affected individuals opt for temporary migration, seeking shelter to recover and then returning to repair or rebuild their homes. Residents accustomed to seasonal rough seas during monsoons accept the minor flooding during this period and attempt to adapt by constructing sea barriers before the monsoon season. This phase may involve multiple episodes of temporary migration and resettlement (Tacoli, 2009). As the hazard events intensify, coastal living becomes increasingly challenging. Some residents, often perceiving higher risks or lower adaptive capacity due to factors like health issues, house conditions, land elevation, and proximity to the sea, choose migration early. Another group of early migrants consisted of those who had lost their homes entirely and had to seek shelter or rent houses for extended periods due to a lack of means to rebuild or migrate (Jennath & Paul, 2022).

The next migration phase involves state assistance, where those who have lost their homes or incurred substantial damages receive housing or land as part of rehabilitation projects (Jennath & Paul, 2022). As the impacts of climate change intensify, a significant number of individuals living in vulnerable coastal areas may face migration or displacement due to either rising sea levels or extreme weather events. In the absence of effective climate and development measures, many families may find themselves compelled to relocate within their state or even farther away in order to escape the consequences of rising sea levels and coastal flooding (Panda, 2020). Worse, those unable to access housing colonies may lose their homes and live in shelters due to their inability to rebuild or migrate. The aforementioned cases indicate a growing trend of climate migration in the coming decades. While attributing climate change directly to sea-level rise is challenging, substantial global and regional evidence indicates the potential for significant displacement unless proactive measures are implemented (Panda, 2020).

As Kerala's population ages and climate change worsens, the state's migration patterns and remittance dependency is highly likely to change with significant impacts on the population's capacity and aspirations to migrate. (Rajan and Zachariah, 2019).

Climate change can lead to a detachment from a place, as people, aware of the threat to their homes, intentionally weaken their ties and form new connections elsewhere (Agyeman et al. 2009). Many migrants in Kerala have reported experiencing trauma and a sense of alienation due to their experiences (Jennath & Paul, 2022). Most of them acknowledge that they have no choice but to adapt to their new life, as they have little hope of returning to their original homes.

The post-disaster needs assessment after the 2018 floods revealed that the trauma and stress resulting from the loss of family and damage to homes, students were not attending school, and there was a significant risk of children, particularly girls, dropping out of school unless measures are taken to ensure their safety and address the emotional impact (UNDP, 2018). The floods also severely affected informal sector workers, who make up over 90% of Kerala's workforce. Approximately 74.5 lakh workers, including 22.8 lakh migrants, had been displaced from employment, causing wage loss for many, including agriculture labourers, coir, handloom, construction workers, and plantation labourers (UNDP, 2018). Relief camp interviews revealed that families in Kerala are enduring immense emotional suffering, including shock, psychosocial damage, distress, trauma, and insecurity due to the loss of homes, livelihoods, possessions, and the death of loved ones. Additionally, the loss of crucial documents like birth certificates and land records added to their burden (UNDP, 2018).

c) Policy Responses and Adaptation Strategies

Kerala is experiencing the tangible consequences of climate change, revealing its vulnerability to these environmental shifts. The repeated floods and landslide losses prompted the Kerala state government to reassess its climate change action plan and allocate significant resources for disaster recovery and rehabilitation efforts. In December 2022, Kerala unveiled SAPCC 2.0 (State Action Plan on Climate Change 2.0), to enhance the state's resilience to climate change impacts. The SAPCC 2.0 report acknowledges that the migration of the local population to other areas will have an impact on economic growth, but does not recognise migration as an adaptive response to climate change pressure, or include it in mitigation policy discussions

The government allocated Rs. 5300 crores in the 2021 state budget to safeguard the coasts due to the substantial impact of coastal disasters (The News Minute, 2021). It has also initiated the Punargeham Project (translation: New House Project) to relocate families living within 50 metres of the shoreline to protect them from erosion. According to a survey conducted by the Fisheries Department in 2018-19, 4,660 families in Alappuzha were living within 50 metres of the coastline (The Hindu Bureau, 2022). However, the relocation disrupts the social fabric of fishing communities, scatters families, and threatens traditional social networks. It also poses challenges in terms of space for social activities and potential conflicts with non-fishing extraction communities in new areas. Additionally, the policy fails to consider gender sensitivity and the economic activities of women in the fishing community. (P., n.d.)

Kerala is one of the few states in India to establish the State Disaster Mitigation Fund along with clear administrative directives for its allocation. (UNDP, 2018) This fund is dedicated to implementing inventive projects aimed at disaster mitigation. The government is taking steps through the Kerala State Disaster Management Authority (KSDMA) to address climate change effects, including risk-informed master plans. Proactive measures are being taken, but there's still work to be done to prevent and mitigate hazards for vulnerable communities.

At the national policy level, there have been limited national initiatives to address the displacement of residents from their homes due to climate-related threats, and there is a notable absence of a comprehensive national strategy for planned relocations of those affected by climate change in India at large. Disaster management at the state level generally covers the short-term displacement resulting from sudden events like cyclones and typhoons. However,

there is a vacuum in managing displacement and migration stemming from gradual phenomena, like sea-level rise.

Natural calamities like floods not only impact lives, infrastructure, and the economy but also inflict significant psychological trauma. Despite the inevitable negative consequences of such disasters, they often compel local populations to seek new economic opportunities, with migration being a prevalent choice, especially in regions like Kerala, which is already known for its history of emigration and a strong inclination towards large-scale migration. (Rajan et al., 2020) The phenomenon of migration is now facing added pressure due to the impact of climate change.

Remittances from migration can play a crucial role in the context of natural disasters, offering both immediate relief and long-term benefits, especially in the case of slow-onset climate change (Tacoli, 2009). They help reduce vulnerability by enabling households to make investments that enhance their resilience and foster greater resilience in disaster-prone regions. (Suleri & Savage, 2006). It is often easier to re-establish remittance flows compared to other sources of income, allowing recipients to initiate the recovery process more swiftly. They also have multiplier effects that stimulate economic activity and benefit entire communities (Rajan et al., 2022).

To adapt to climate change impacts at multiple levels, Kerala can use migration as an adaptation strategy to build community resilience, improve infrastructure, and better prepare and respond to disasters. Relying solely on migration may not serve all of Kerala's population, potentially impacting post-disaster relief and reconstruction efforts. Therefore, any policy aiming to use migration as an adaptation strategy should consider a range of factors and diverse population needs. Kerala must explore innovative approaches, including facilitating migration or alternative methods, as its working-age population declines. For this, a series of recommendations are imperative:

- 1. Policy Framework:** The existing legal and institutional structures in the country cater to region-specific climate change vulnerabilities and infrastructure projects and policies but do not directly tackle climate displacement, migration or its diverse experiences. The Inter-State Migrant Workmen Act of 1979, which regulates interstate migration, does not contain a distinct category for people displaced by climate-related hazards, and there have been no modifications to address the needs of climate migrants (Panda, 2020). A comprehensive policy and legal framework that explicitly acknowledges different types of climate-induced migration and provides rights protection for climate migrants must be developed and integrated into national climate change and disaster management policies.
- 2. Data and Research:** In India, migration is predominantly seen as a livelihood issue, with insufficient gender-disaggregated data and uncertainty about total migrant numbers, displaced populations, and climate change-induced migrants. The absence of comprehensive data hampers policy formulation with a well-rounded approach. (Nadimpalli, 2023) Greater investment needs to be made in data collection and research efforts to understand the dynamics, patterns, and impacts of climate-induced migration, enabling evidence-based policy decisions.
- 3. Vulnerable Group Identification and Social Security:** Kerala is critically dependent on the remittance economy which means that many migrants support dependents,

such as the elderly and children, back home. This type of household structure can leave the dependents highly vulnerable to disaster impacts. Therefore, implementing mechanisms for identifying and categorising vulnerable groups within migrant populations is necessary. Those needing specific assistance, such as healthcare, education, and livelihood support must be prioritised.

- 4. Involving Stakeholders in Resettlement Initiatives-** Moving communities away from hazardous areas in a coordinated and well-managed way, also called managed retreats, can be a valuable adaptation strategy. However, relocating entire communities poses significant challenges due to the large number of people involved (Panda, 2020). Resettlement projects need to be community-centric, encompassing not only housing but also livelihoods and access to services (P., n.d). The government should involve the affected community in the resettlement process and consider their refusal to relocate as a signal to address underlying issues rather than absolving responsibility.
- 5. Improving Disaster Preparedness and Climate Resilience:** Strengthen disaster preparedness and response mechanisms to alleviate the migration pressure and help the immobile populations. Conduct awareness campaigns and capacity-building programs for communities and local authorities to better understand and respond to climate-induced migration. Prioritise climate resilience measures, including eco-sensitive infrastructure development and reviewing building codes., to reduce climate-induced displacement and enhance adaptation strategies.

Initiatives like watershed management, crop insurance, and the development of village industries to reduce dependency on agriculture must be promoted. Furthermore, climate-resilient farming practices should be explored. In destination areas, particularly cities where rural labourers migrate, ensuring their health and safety is paramount. This involves proper documentation, access to social security services, and ration distribution.

The Kerala State Planning Board plays a crucial role in coordinating employment-related aspects in the state (UNDP, 2018). To enhance its effectiveness, it should be reinforced as a unified platform that addresses employment issues arising from demographic shifts, educated unemployment, emigration of Kerala workers, and social security in the context of rebuilding Kerala. Furthermore, it should tackle the task of generating environmentally friendly job opportunities in the state's economy.

Incorporating these recommendations into national policy and action plans is crucial to recognize climate-induced migration as a force and challenge, ensuring that the most vulnerable among migrant populations receive the assistance they urgently require.

CONCLUSION

Climate-induced migration is a complex phenomenon influenced by various factors, and it is intensifying the current trend of high mobility in Kerala. The state's vulnerability to climate-related disasters, such as floods and coastal erosion, has led to population displacement and internal migration. Such events disproportionately affect impoverished and vulnerable communities, often trapping them in the region and exacerbating the situation with each cycle of environmental stress. Kerala has recognized the urgency of addressing climate-related challenges and has initiated policy responses and adaptation strategies. The State Disaster Mitigation Fund and efforts to relocate vulnerable populations are steps in the right direction. However, there is room for improvement in policy coherence on the climate and migration front.

Recommendations include the development of a comprehensive policy framework that explicitly acknowledges climate-induced migration, investment in data collection and research, identification and support for vulnerable groups within migrant populations, and strengthening disaster preparedness and climate resilience measures. Similar investigations should be conducted in other vulnerable geographic areas of India facing different environmental challenges. There is a pressing need for more proactive national and local policies that plan for the managed retreat of coastal populations at risk from the impacts of sea rise. Kerala's experience with climate-induced migration can serve as a valuable lesson for other regions facing similar challenges in a changing global climate scenario.

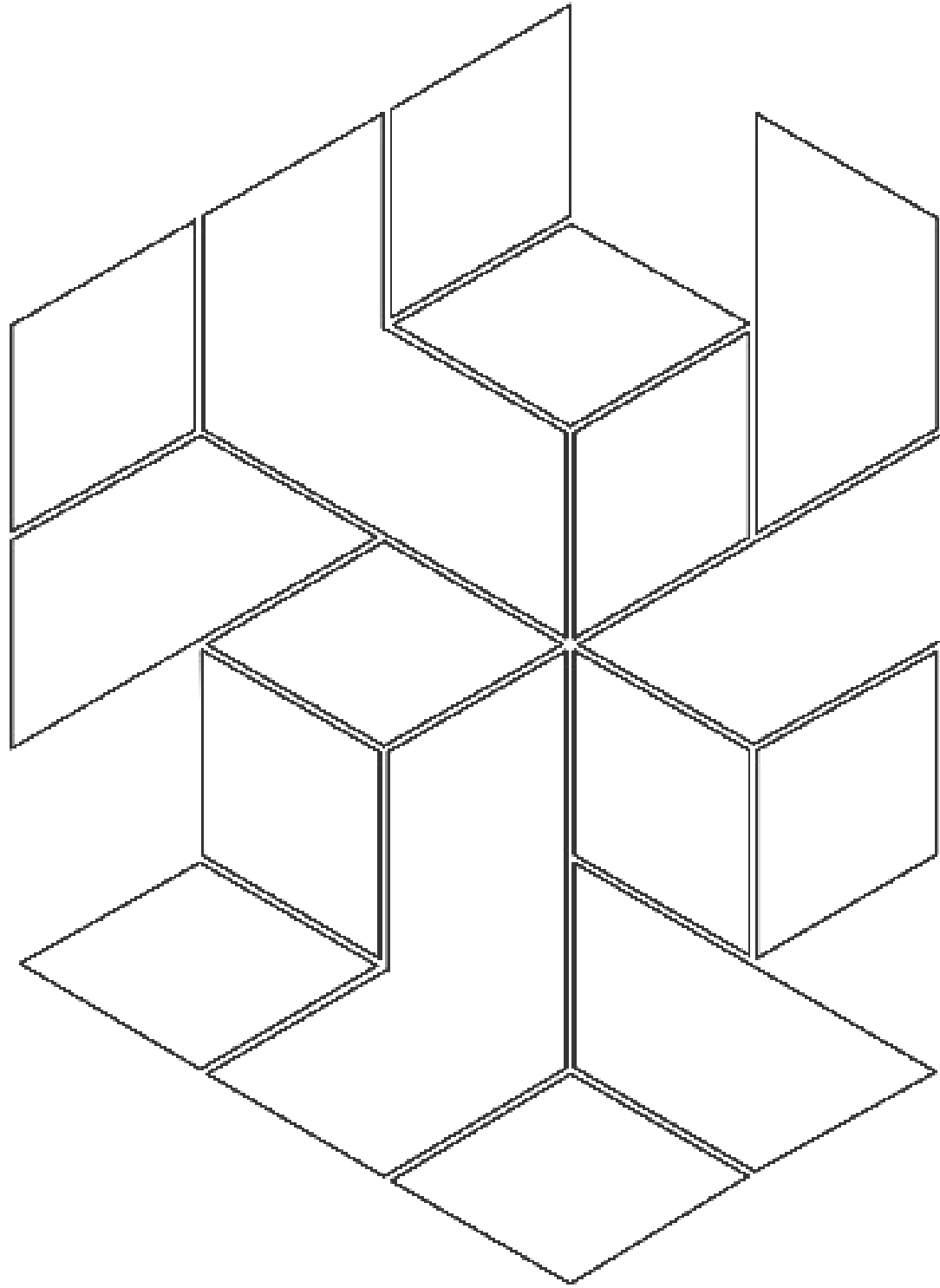
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