



DETERMINANTS OF CLIMATE FINANCE FLOWS: A SYSTEMATIC LITERATURE REVIEW

Kanksha Malhotra

Research Scholar, University Business School, Panjab University, Chandigarh

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Abstract: International collaboration among the governments of various nations is secured to combat climate change. Climate talks will remain futile without the transfer of funds across nations. Therefore, developed countries have agreed to transfer climate-related aid to developing countries. The present study aims to map literature discussing determinants of such climate finance allocation from donor countries to the recipient nations. A systematic literature review approach has been adopted to map the literature. The study uses the Scopus database to review the present landscape of literature on determinants of climate finance flows. The systematic literature review highlights geographical coverage, temporal classification and tools and techniques used in the existing literature. Further, it has been found that there are several significant determinants relevant in determining flows of climate-related aid. Future research directions have also been highlighted in the study by identifying various research gaps. There is a dearth of literature in respect of understanding region-specific determinants of climate finance flows. Comparative case studies and deployment of qualitative research techniques could also be done in the future.

Keywords: Climate Finance, Determinants, Climate Change, Donor nations, Recipient nations

1. Introduction

The threat of climate change looms large in the present century and can be directly and intricately linked to humans across regions, gender, socioeconomic status and culture. Citizens around the world are subjected to abnormal weather events, which are attributable to climate change, and thus face grim predictions of humanity's future (Seo, 2013). Since climate change is considered a classic example of a global

public good, a unified action plan needs to be designed to combat climate change at the global level. Climate change negotiations have been at the global center stage for decades. International negotiations have been instrumental in covering major climate policy perspectives ranging from adaptation and mitigation to technology transfer (Ari & Isik, 2022). In order to contain the ever-rising levels of greenhouse gas emissions, it becomes pertinent that adequate support is provided to developing countries (UNFCCC, 1992). Globally, countries came together to address climate-related issues. Since differences exist between developed countries and developing countries, funds are transferred to countries still in the developing phase to fuel the process of bringing the desired change in climate and environment.

Climate-related finance allocation to different countries is disbursed with an aim of enhancing and strengthening efforts directed towards climate change adaptation and mitigation of the recipient nations. Ensuring climate justice for countries and communities across the globe is the pertinent need of the hour. Thus, it becomes important to understand the existing research evidence to understand determinants of climate aid, ensuring climate justice and empowering humanity and business. Accordingly, the research questions for this study have been framed as follows-

- RQ1- What are the various determinants of climate aid between countries?
- RQ2- Does any one determinant holds more significance than the other?
- RQ3- What are the future research avenues?

The present study has been undertaken to map the existing body of literature to understand the determinants of climate-related finance. In order to realize the full potential of climate finance in empowering business houses, it is foremost to understand determinants of climate flows across the globe. The systematic literature review helps in understanding various facets of existing literature pertaining to climate finance. The study in the end highlights how the government make policy level changes at national and international level for improving climate.

The study is divided into various sections. Section 2 provides a description of the research methodology used. Section 3 brings forth peculiar characteristics of literature with reference to geographical coverage, theoretical underpinnings and techniques and tools used. Further, Section 3 summarizes major research findings.

Section 4 is instrumental in representing the implications and future research directions. Section 5 presents the conclusion of the study.

2. Research Methodology

The aim of the study is to map the existing literature on the determinants of climate aid flows using the technique of Systematic Literature Review. Systematic reviews enable policy makers, researchers, practitioners, and the public to synthesize the evidence in the literature on a specific research question (Bangdiwala, 2024).

2.1. Identification of electronic database

The first and foremost step is to identify a database for searching relevant literature. Scopus has been used as a database in the present study to identify the relevant articles to answer the research questions.

2.2. Identification of Keywords

To ensure building of a detailed understanding of the determinants of climate-related development finance flows across globe, a search for relevant literature was conducted by using certain key terms in the Scopus database. Keywords used for conducting search on Scopus database includes climate finance, green climate fund, adaptation fund, mitigation fund, climate aid, adaptation finance, mitigation finance, aid, international agreement, climate policy, climate, climate-related, sustainable, green, donor countries, recipient countries, donor nations, recipient nation, donor, recipient, bilateral, multilateral, donor interests, recipient merits, recipient need, determinants, drivers, allocation. The search string used has been given in Table 2. The search string used helps provide a database of research articles which are further screened as outlined in the subsequent section.

2.3. Criteria used for Identification

Several criteria (exclusion as well as inclusion) are used to identify the relevant articles (Carrera-Rivera et al., 2021). Post reading the abstracts, the articles are screened for its relevance (Carrera-Rivera et al., 2021). In case of any ambiguity, the articles are further skimmed and read to constitute the final sample of Systematic Literature Review (Carrera-Rivera et al., 2021). Table 1 highlights various inclusion and exclusion criteria used along the search string. Further, Table 2 provides a snapshot of the steps taken to arrive at final sample for literature review.

Table 1: Criteria for exclusion and inclusion

Panel A Exclusion
Papers that are literature review
Conference Papers and Book Chapters
Unavailable Full-text articles
Panel B Inclusion
Presence of keywords in the title, abstract or keyword section of the study
Articles from Social Sciences; Economics, Econometrics and Finance; Business, Management and Accounting

Source: Author's Own Representation

Table 2: Step wise filtering of Research Articles

<i>Steps</i>	<i>Description</i>	<i>No. of Articles</i>
Step I	TITLE-ABS-KEY ("climate finance" OR "green climate fund" OR "adaptation fund" OR "mitigation fund" OR "climate aid" OR "adaptation finance" OR "mitigation finance" OR "aid" OR "international agreement" OR "climate policy") AND TITLE-ABS-KEY ("climate" OR "climate-related" OR "sustainable" OR "green") AND TITLE-ABS-KEY ("donor countries" OR "recipient countries" OR "donor nations" OR "recipient nation" OR "donor" OR "recipient" OR "bilateral" OR "multilateral" OR "Donor interests" OR "Recipient merits" OR "Recipient need") AND TITLE-ABS-KEY ("determinants" OR "drivers" OR "allocation") AND (LIMIT-TO (SUBJAREA , "SOC") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "BUSI"))	157
Step II	Screening after reading abstract	31
Step III	Screening after reading full paper	24

Source: Author's Own Representation

3. Results

3.1. Geographical Coverage

On classifying the studies, it has been observed that most of the studies cover several countries. Majority of studies cover plethora of countries ranging across globe (Halimanjaya, 2016; Betzold & Weiler, 2017; Klöck et al., 2018; Weiler et al., 2018; Mori et al., 2019; Peterson & Skovgaard, 2019; Doshi & Garschagen, 2020; Garschagen & Doshi, 2022; Islam, 2022; Bayramoglu et al., 2023; Han & Cheng, 2023; Yoon et al., 2023; Lee & Lim, 2024; Liu et al., 2024). There are few studies which focussed on countries from a specific part of world such as Southeast Asia (Gupta & Vadlamudy, 2025), Asia, Africa and Europe (Basty & Ghachem, 2022), Asia-Pacific region (Samuwai & Hills, 2018), Africa-specific study (Weiler & Sanubi, 2019), Sub-

Saharan African Countries (Doku et al., 2021), SIDS and other vulnerable countries (Tennant et al., 2024). There is a study focusing on two donors, i.e., Germany and South Korea and four recipients from Southeast Asia, i.e., Cambodia, Laos, Myanmar and Vietnam (Bessey & Palumbarit, 2016). The number of studies focusing on a specific country are limited. Hänze and Jansesberger (2026) focused on Philippines and provided subnational evidence. There is another study based on Czech Republic (Opršal & Harmáček, 2019). Further, Gurresø (2024) studied Germany specifically. Halimanjaya (2016) covered recipient countries across the globe however, the focus has been on only five donors. Figure 1 depicts a snapshot view of number of studies based on geographical coverage.

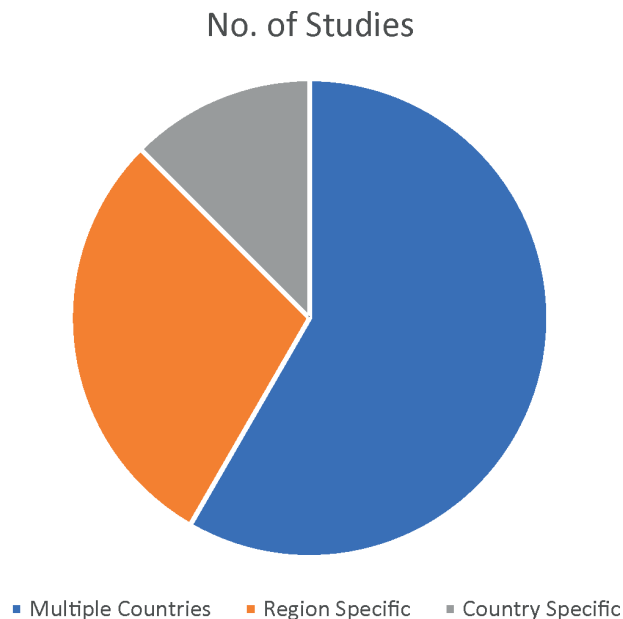


Figure 1: Geographical Coverage of Research Articles

Source: Author's Own Representation

3.2. Temporal

Most of the relevant literature has been published recently primarily due to reasons such as (1) climate talks although emerged in 20th century, use of Rio markers to identify climate aid flows started in 2010; (2) heightened attention towards climate-related development finance post signing of Paris Agreement; (3) visible damages observed in environment has garnered attention of public at large.

Figure 2 highlights the year wise distribution of number of research articles. The relevant literature has been published since 2016. The majority chunk of papers being published in 2019 and 2024.

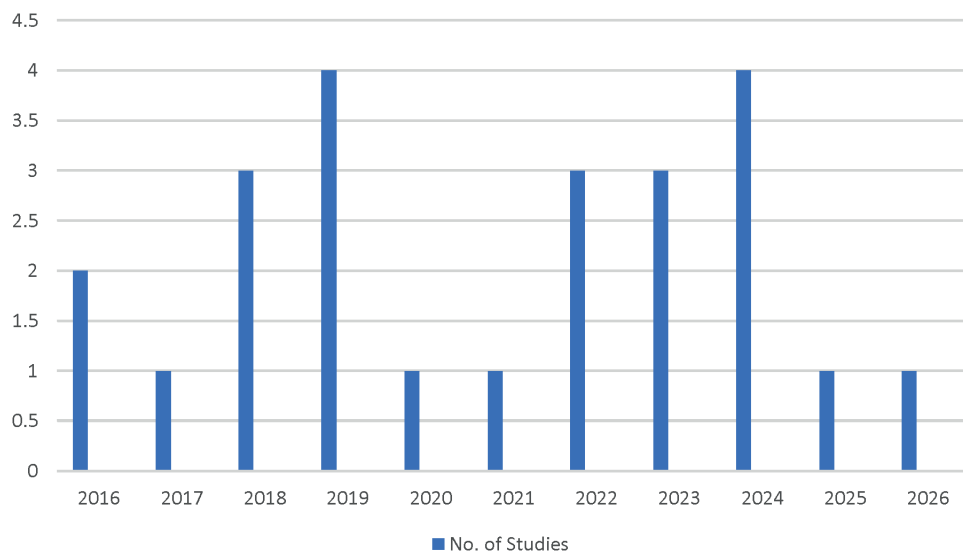


Figure 2: Year wise Publications

Source: Author's Own Representation

3.3. Theoretical Underpinnings

The field of Climate finance is connected to several disciplines and makes use of various theories. The literature highlights use of Polluter pay principle (Basty & Ghachem, 2022; Gupta & Vadlamudy, 2025), Realist Theory (Lee & Lim, 2024) and Theory of altruism (Opršal & Harmáček, 2019). The use of theories has not been widespread and theoretical underpinnings have been largely absent.

The Polluter Pay Principle argues that polluters must be charged with cost of pollution control and prevention. Historical responsibility for emissions based on Polluter pay principle and ability to pay has been used to provide a theoretical base in a study (Basty & Ghachem, 2022). The theory of altruism argues to keep in mind other humans and their well being. Opršal & Harmáček (2019) explained theory of altruism in light of recipient needs, emphasizing the fact that greater needs correspond to a greater amount of aid.

International relations constitute an important strand of Realism. It argues that nations advance their domestic interests. Its importance is underscored in guiding

nations in foreign policies. In view of climate aid, the main argument is that nations prioritize their own national and security needs. On the basis of this theory, donors behave as rational actors and aim to safeguard their own survival and interests. Lee and Lim (2024) explain that deployment of development aid aims to fulfil donor's interests.

3.4. Techniques and Tools for Analysis

Since several countries over a number of years have been analysed in most of studies, data has assumed the form of panel data. The most widely used tool to analyse the data is panel data regression. Two-stage Cragg model (Weiler & Sanubi, 2019). Binary logistic regression and multiple regression (Mori et al., 2019). Qualitative assessment has also been done using semi-structured interviews or case study approach (Doshi & Garschagen, 2020; Gurresø 2024).

Poisson Regression (Hänze & Jansesberger, 2026), Multilevel Logistic Regression (Gupta & Vadlamudy, 2025), GMM (Basty & Ghachem, 2022; Doku et al., 2021; Islam, 2022; Liu et al., 2024), Correlation (Doshi & Garschagen, 2020) and fixed effect and IV-2SLS (Bayramoglu et al., 2023) have also been used across sample studies. Table 3 provides a summary of major methodological observations across research papers.

Table 3: Tools and Techniques used in Research Articles

<i>Methodology</i>	<i>Research Paper</i>
Poisson Regression	Hänze & Jansesberger (2026)
Multilevel Logistic Regression	Gupta & Vadlamudy (2025)
Double Hurdle Model	Han & Cheng (2023); Lee & Lim (2024)
Fixed effect and instrumental variable-2 stage least square estimations (IV-2SLS)	Bayramoglu et al. (2023)
Generalised Method of Moments	Doku et al. (2021); Basty & Ghachem (2022); Islam (2022)
2SIV-GMM	Liu et al. (2024)
Quantile Regression	Doku et al. (2021)
Correlation	Doshi & Garschagen (2020)
Semi Structured Interview (Qualitative)	Doshi & Garschagen (2020)
Two Stage Cragg Model	Weiler et al. (2018); Weiler & Sanubi (2019); Tennant et al. (2024)
Binary Logistic Regression and Multiple Regression	Mori et al. (2019)

<i>Methodology</i>	<i>Research Paper</i>
Fixed effect panel data regression	Yoon et al. (2023)
Two Stage- Logit and OLS	Halimanjaya (2016); Peterson & Skovgaard (2019)
Tobit model	Opršal & Harmáček (2019)
Climate public expenditure and institutional review	Samuwai & Hills (2018)
Random effect regression model	Klöck et al. (2018)
Hierarchical Regression- Random Regression	Betzold & Weiler (2017)
Case Study	Gurresø (2024)

Source: Author's Own Representation

3.5. Major Findings

Amid rising concerns of climate change, climate finance research is growing exponentially. The previous section highlights geographical coverage, theoretical underpinnings, research tools used, and year of publication. This section aims to understand major findings and suggestions given in the literature.

3.5.1. Significant Determinants

The literature is replete with studies that classify major determinants of bilateral climate aid allocation in three categories, i.e., Donor Interests, Recipient Merit and Recipient Need. Donor interests are measured using multiple proxies, namely bilateral trade, colonial ties, distance, military spending etc. It has been found that donor interests do act as a significant determinant of climate aid allocation (Bessey & Palumbarit, 2016; Weiler et al., 2018; Lee & Lim, 2024; Tennant et al., 2024). While Recipient Merits has been measured using quality of governance, environmental performance etc., Recipient needs have been proxied by measures such as population, per capita GDP, Disaster Recovery, Vulnerability etc. It has been observed that they act as a strong determinant for climate-related development finance allocation (Bessey & Palumbarit, 2016; Weiler et al., 2018; Lee & Lim, 2024; Tennant et al., 2024). Donors with larger populations tend to provide more aid, whereas recipients with more population tend to receive less aid (Han & Cheng, 2023). In Sub-Saharan African countries, it has been found that countries with a moderate population have emerged as a significant determinant of climate aid (Doku et al., 2021). Bastý and Ghachem (2022), while studying the relationship between vulnerability and climate aid, observed that after a certain threshold limit, the

countries that are most vulnerable will be provided the most amount of adaptation aid. However, this convexity will not apply to all sectors uniformly, with the exception of the infrastructure sector. Further, a positive effect of governance index has been observed on adaptation aid. Sectors possessing good economic readiness tend to receive larger amount of adaptation aid. Mori et al. (2019) concluded that vulnerability has a significant impact on ability of a country in accessing climate aid. Further, it also impacts volume of aid received by a country. Readiness of the country does not significantly affect access of fund; however, it does significantly affect the volume of funding received. Based on income level, low-income countries can more likely access funds, whereas on basis of development, countries with lesser degree of development are less likely to access fund. In Sub Sahara African-specific study, Government readiness, Economic readiness and social readiness have emerged as significant determinants of climate aid (Doku et al., 2021).

On the contrary, Weiler and Sanubi (2019) observed that recipient merit model is no longer an important determinant in climate aid allocation. Further, donor interest model and recipient need model both possess equal importance and no particular model dominates over other. Klöck et al. (2018) concluded that donor responsibility and capability proxied by per capita emission and total emissions, have been associated with providing a lesser amount of aid. Total emissions have a statistically significant and negative impact. Further, it has been observed that less climate aid has been provided by countries with more green party representatives, while no relation has been found with population with tertiary education. Both these indicators have been used as a proxy for greenness. Donors exposed to a higher level of transnational climate impact have been found to invest higher levels of funds domestically rather than providing it as aid to other countries.

The literature presents empirical evidence of determinants not studied under light of Donor Interests, Recipient Merits and Recipient Needs collectively, rather presenting empirical evidence on individual determinant or studying allocation from a different perspective. Studies have focussed on Vulnerability (Betzold & Weiler, 2017; Islam, 2022) and Bilateral Trade (Bayramoglu et al., 2023) as a determinant of climate finance allocation. The results have been mixed, wherein in some studies vulnerability is not the primary determinant of bilateral climate aid flows (Doshi & Garschagen, 2020), however, in others it has been observed that vulnerability act as a significant determinant of climate aid allocation (Betzold & Weiler, 2017; Islam, 2022). Bastý & Ghachem (2022) concluded that a sector-dependent relationship has

been found between adaptation aid and vulnerability. On the same lines, Bilateral trade is an important determinant of climate aid (Weiler & Sanubi, 2019). Further, Bayramoglu et al. (2023) concluded that a positive relationship exists between exports from donor countries and recipient nations, respectively, with climate aid transfers. Exports act as a significant determinant of both adaptation and mitigation aid (Bayramoglu et al., 2023). Opršal and Harmáček (2019) concluded that climate aid exhibits a weak response to the environmental needs of country. Countries with higher per capita carbon emissions and a higher risk of biodiversity decline received a higher amount of environmental aid. Further, it has been found that even non-environmental objectives like colonial ties affect environmental aid to a considerable degree.

Recent studies have viewed determinants from a different perspective. Peterson and Skovgaard (2019) concluded that involvement of Ministries of Development and Finance had an influence on both the selection and allocation phases. Involvement of Ministry of Development has been associated with selection of low-income countries as recipients of climate aid; however, it doesn't ensure receipt of a higher quantum of climate aid. Further, involvement of Ministry of Environment had an influence on selection of recipient and not on allocation of aid. Involvement of Ministry of Environment has been associated with allies of UNFCCC receiving higher amount of climate aid. Gurrese (2024) conclude that institutional beliefs shape how government understand vulnerability and allocate aid. Doshi & Garschagen (2020) concluded that from donor's perspective, perceived capacity to manage and implement projects, other political priorities and commitment given to climate change are factors instrumental in determining bilateral climate aid flows. Further, from recipient's perspective strong institutional capacity also plays an important role in determining climate finance flow. Further, credible international commitment towards the mitigation of climate change and bilateral trade volume significantly increases climate aid (Yoon et al., 2023).

Samuwai and Hills (2018) studied climate aid readiness of countries in Asia Pacific region on three dimensions namely, i. Policy and Institutions, ii. Fiscal Policy Environment and iii. Knowledge Management and Learning. It has been found that readiness does have a small yet predictable impact on climate aid accessed. Allocation of adaptation aid has a strong association with hazard impacts (Hänze & Jansesberger, 2026). Recent human sufferings thus act as a determinant while allocating climate aid (Hänze & Jansesberger, 2026). Further, electoral alignment between province

and president also emerged as a significant determinant of adaptation aid (Hänze & Jansesberger, 2026). Han and Cheng (2023) concluded that higher quality of public administration and budgetary and financial management have been found to exhibit association with financial aid, however, public administration is responsible in bringing in financial aid. INDC commitment does impact likelihood of receiving aid but does not affect quantum of aid. Higher debt of donor countries leads to lesser aid being provided.

3.5.2. Adaptation and Mitigation

The fight against climate change involves both mitigation and adaptation efforts. Thus, flows of climate finance are targeted explicitly for adaptation and mitigation projects. Adaptation finance accounts for the adverse effects of climate change and aims at preventing it, while mitigation finance aims to lower the amount of GHG emissions. The research studies highlight determinants of climate aid impacting mitigation and adaptation aid. Some studies focus only on one aspect of climate aid, i.e., either adaptation aid or mitigation aid, whereas some studies draw a comparison between both. Thus, this section highlights determinants of adaptation and mitigation of climate-related flows individually. There are determinants that impact both adaptation and mitigation aid, while there are determinants that have a different impact on both.

The quality of public administration impacts adaptation as well as mitigation finance, whereas only adaptation finance is impacted by the quality of budgetary and financial management (Han & Cheng, 2023). Natural Disaster Risk acts as a determinant of occurrence for both kinds of aid, i.e., mitigation and adaptation. However, the amount of mitigation aid is affected by natural disaster risk (Han & Cheng, 2023). Colonial ties, common religion, and language have an impact on mitigation aid flows, while colonial ties and common language have an impact on adaptation aid (Han & Cheng, 2023). Donors with higher GDP usually provide more for both types of aid, however, recipients with higher GDP receive larger amount for mitigation aid but not for adaptation aid (Han & Cheng, 2023). Liu et al. (2024) concluded that an increase in climate vulnerability has a significant positive impact on both mitigation and adaptation aid. While the quality of government has impact only on mitigation aid allocation, both mitigation and adaptation aid have been impacted by low-carbon technologies. Further, it has been observed that mitigation funds have been impacted to a larger extent by climate vulnerability in cases where financial development exceeded the threshold.

The effect of exports is higher on mitigation aid in comparison to adaptation aid (Bayramoglu et al., 2023). Readiness does have a bias towards mitigation since it places a precedence on the creation of an enabling environment, which is private sector-centric (Samuwai & Hills, 2018). The provision of adaptation aid has been observed to be reduced by higher per capita emissions, while it has a limited impact on mitigation aid (Klöck et al., 2018). Halimanjaya (2016) focused on mitigation finance and aimed to identify determinants of climate mitigation aid. Global needs, recipient needs, recipient performance and donor interests proxied by various measures have been studied as determinants. It has been concluded that response of all five donor countries towards global needs is homogeneous. Good institutional performance and large carbon sinks have emerged as a determinant of mitigation aid allocation. Geopolitical interests have also been a significant determinant, especially in case of two donors, i.e., Japan and France. However, the determinants across all five donors have been found to be heterogeneous. Global needs and recipient needs have invoked a positive response, but donors' interests also serve as a determinant.

3.5.3. Roadmap for policymakers

Implications for policymakers for future designing and redesigning of policies have become one of the foremost significance of these research studies. The present policy landscape needs to be implemented effectively to ensure better results. Gupta and Vadlamudy (2025) suggested that continuous monitoring and reinforcement through timely policy intervention will be instrumental in ensuring current policy framework effectiveness. Further, the depth of integration of climate aid flows should be monitored. An integration of development and climate objectives to ensure effective utilisation of available resources has been suggested. Liu et al. (2024) suggested implications for policymakers from both donors' and recipients' perspectives. While donors have been encouraged to assume greater responsibility and provide larger amounts of aid to vulnerable countries, recipients need improvement in readiness and the quality of government.

Every policy needs to be fine-tuned and redesigned to enhance benefits and changes in the desired direction. Hänze & Jansesberger (2026) have stressed the need for stronger safeguards against political capture and the instrumentalization of multilateral adaptation projects. A well-structured climate impact assessment ensuring climate objectives get embedded in the design of projects has been suggested to ensure a transition in global mechanisms towards outcome-based

financing models (Gupta & Vadlamudy, 2025). Sector-wise priorities should be established by climate policy makers independent of the country so that vital sectors can be studied in depth and adaptive investments can be made (Basty & Ghachem, 2022). Most vulnerable countries should focus on improvisation at sub-national and national levels of climate finance readiness of institutions (Doshi & Garschagen, 2020). Since current readiness pathways have been found to yield few results, it is pertinent to rethink current readiness towards alternative funding sources (Samuwai & Hills, 2018).

4. Future Research Avenues

A Systematic Literature Review is one of the effective tools to understand available literature and decipher future research avenues. In future, the studies could deploy Artificial Intelligence tools to analyse data. Further, the implications of trade related measure like European Union's carbon border adjustment on allocation of climate aid could be studied in future (Bayramoglu et al., 2023). Effectiveness of projects funded by adaptation aid could be studied in future (Basty & Ghachem, 2022). Future research could focus on designing a sectoral vulnerability index accounting for climate change along with good governance and social justice (Basty & Ghachem, 2022).

In future, researchers and academicians could focus on more country-specific and region-specific studies. Further, cross-regional and cross-country comparisons can also be done. A more comprehensive inclusion of factors measuring Donor Interests, Recipient Merits and Recipient Needs should be carried out to ascertain more determinants of climate-related flows across countries. Qualitative research is needed in the future to understand how vulnerability considerations are reflected in the allocation of adaptation aid decisions of donors (Gurresø, 2024).

5. Conclusion

The Paris Agreement was signed in 2015, and thus, climate finance has assumed greater significance at the national and international levels. With NDC targets updated every five years, the world has become increasingly conscious of the need to combat climate change and protect humanity in the future. Thus, in the background of heightened attention towards climate aid, it becomes pertinent to review the existing body of literature. The present work is important since it highlights determinants of climate aid.

The empirical evidence suggests that donor interests, recipient merits and recipient needs emerge as a significant determinant of climate aid allocation. Vulnerability and Bilateral trade are few such determinants which have been extensively studied and found to be significant in influencing flow of climate aid. The research studies provide a roadmap for policymakers.

The present study can be enhanced by including other databases in future, such as Web of Science. A meta-analysis in the future could help deepen understanding of the research topic. Further, a bibliometric analysis can also be conducted to enhance the present study.

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