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India's Approach to Triangular Climate Cooperation

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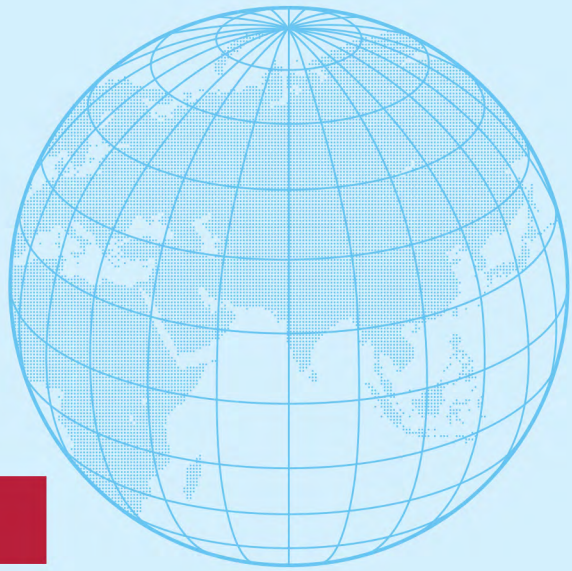

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List of Abbreviations

AI	Artificial Intelligence
BAPA	Buenos Aires Plan of Action
CDRI	Coalition for Disaster Resilient Infrastructure
DAKSHIN	Development and Knowledge Sharing Initiative
Empraba	Brazil's Agricultural Research Corporation
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
GHA	German Helmholtz Association
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
IIMR	Indian Institute of Millets Research
IRA	Inflation Reduction Act
ISA	International Solar Alliance
LDCs	Least Developed Countries
LiFE	Lifestyle for Environment
MANAGE	National Institute of Agricultural Extension Management
MEA	Ministry of External Affairs
MNRE	Ministry of New and Renewable Energy
MoEFCC	Ministry of Environment, Forest and Climate Change
NABARD	National Bank for Agriculture and Rural Development
NAFCC	National Adaptation Fund for Climate Change
NGO	Non-Governmental Organisation
NICRA	National Initiative on Climate Resiliant Agriculture
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PM KUSUM	Pradhan Mantri Kisan Urja Surakshaevam Utthaan Mahabhiyan
RIS	Research and Information System for Developing Countries
SIDS	Small Island Developing States
TERI	The Energy Resources Institute
TriDep	India-U.S. Triangular Development Partnership
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention for Climate Change
UNOSSC	United Nations Office for South-South Cooperation
USA	United States of America
USAID	United States Agency for International Development
WBREDA	West Bengal Renewable Energy Development Agency

Abstract

Climate finance, knowledge sharing, and technology transfer mechanisms continue to emphasise North-South channels, despite power shifts in global governance. This paradigm is proving insufficient for developing countries to catalyse and implement cost-effective climate solutions. There is an opportunity to explore alternate mechanisms for improved climate action such as triangular cooperation. Triangular cooperation is a mechanism where two developing countries cooperate, facilitated by a multilateral agency or industrialised country. Triangular cooperation creates a possibility for emerging economies like India to leverage successful experiences from their own development to implement appropriate, context-specific climate action across the Global South.

Over the past decade, India has actively entered several triangular agreements with Northern partners and multilateral agencies, often highlighting climate mitigation and adaptation as key areas of focus. This paper calls for a research agenda to understand the motivations for India and its partner countries to focus on decarbonisation in its triangular agreements. The sectors and regions that are most suitable for cooperation and the institutional channels of engagement must be explored more thoroughly. Studies on the role that civil society and the private sector play to create strong linkages for knowledge sharing and technology transfer are critical to successful triangular cooperation. This research agenda may not only guide Indian policymakers but also provide a broader action plan for how climate finance and resources from the North can be more effectively deployed to accelerate decarbonisation in the Global South. Therefore, effective policy recommendations based on empirical studies from an emerging country perspective are critical to creating triangular partnerships that are institutionally robust, impactful, and truly horizontal.

This discussion paper also highlights how triangular climate cooperation is another lens through which India's stance in international cooperation can be understood. It is important to understand whether India plays a passive role in such agreements, merely facilitating the agenda of donor countries, or whether India actively shapes the climate agenda, bringing to the table financial and technical norms, standards, and resources? Thus, it is important to study what factors drive India to navigate triangular arrangements, and what their interests are in doing so amongst other forms of climate diplomacy.

Executive Summary

Addressing the challenge of climate change demands global collective action. An emphasis on traditional North-South paradigms of resource transfer may be one of the reasons for insufficient pace and scale of mitigation and adaptation efforts. This is largely due to inadequate financing and technological barriers within an evolving geopolitical landscape. Consequently, alternative paradigms like triangular cooperation, which emphasise improved even burden-sharing and transfer of appropriate policy and technology solutions, are worth exploring.

While India has engaged in one-off, fragmented triangular projects since the 1950s, over the past decade the country has started to engage in longer-term agreements with partner countries and multilateral institutions. These agreements tend to highlight climate resilience and energy transitions as a key focus sector. It is important to analyse whether these agreements are political wish-lists, or if they can actually result in meaningful collaboration. This paper calls for an exploration of the role that triangular cooperation plays in India's climate diplomacy. It analyses the advantages and challenges of this model, examines India's experience and capabilities, and proposes a research agenda to inform policy decisions and unlock opportunities for triangular climate cooperation.

The Potential of Triangular Cooperation

Triangular cooperation offers a promising alternative for climate action by:

- **Leveraging Strengths:** It combines the technical expertise and financial know-how of Northern partners with the context-specific knowledge and experience of pivotal countries like India. This allows for more effective knowledge transfer and capacity building.
- **Building Partnerships and Networks:** It fosters collaboration amongst partners across regions, who may not have traditionally engaged with each other. This enables countries with shared challenges and developmental contexts to learn from each other and build lasting partnerships for climate action.
- **Institutional Benefits and Low Costs of Implementation:** It promotes flexibility and innovation, moving away from rigid donor-recipient models and facilitating the co-creation of tailored solutions. It also allows for the implementation of appropriate solutions, while using established institutional channels of donor partners. The comparatively lower costs of technology procurement and human resources from countries in the Global South can lead to increased efficiency of development finance compared to direct implementation by industrialised countries.

India's Potential as a Pivotal Partner

India has valuable experience in addressing climate change within the Global South context of economic growth and sustainable development. It has pioneered appropriate, successful domestic policies, financing technology solutions in areas like renewable energy, climate-smart agriculture, and disaster risk reduction at scale. The country's rising economic and geopolitical influence, coupled with its commitment to South-South cooperation, positions it as a credible partner for driving climate action in the Global South.

To fully realise India's potential in triangular climate cooperation, several key research areas need to be addressed:

- **Triangular Cooperation Within India's Climate Diplomacy:** Amongst different venues available for India to engage in climate diplomacy, analysis on how triangular cooperation fits into the broader climate strategy and its place amongst other forms of diplomacy is required. The partners that India chooses to engage with, institutional channels, and the choices of technology shared amongst countries are important insights to understand the role that triangular cooperation can play for India to meet its aspirations to be a global climate leader. It is important to understand whether India is passive in such agreements, merely facilitating the agenda of donor countries, or whether India actively shapes the climate agenda, bringing to the table financial and technical norms, standards, and resources? If so, it is important to study what factors drive India to navigate triangular arrangements, and what its interests are. It is also important to evaluate the extent to which these agreements have been implemented and their impact and effectiveness.

- **Exploring Channels of Engagement:** India engages in triangular cooperation through various channels. The first is by expanding engagement with industrialised countries that India has strong bilateral relationships with by adding a recipient partner. Second, India works as a partner with multilateral agencies such as the UN to build specific funds and programmes for projects in third countries. Lastly, the most innovative option has been for the country to spearhead global triangular platforms such as the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure. If India is to expand its ambitions for global climate cooperation, it becomes important to understand how and why India engages in triangular cooperation via these different institutional mechanisms across geographies and sectors. The merit of different institutional mechanisms, their usefulness, and policy recommendations to strengthen these channels can provide domestic as well as international stakeholders with important insights to increase the success of new triangular modalities, while reducing fragmentation, poor monitoring, and evaluation.
- **Balancing Horizontality and Formalisation:** India, along with its partner countries, would benefit from creating guidelines, norms, and structured mechanisms around triangular cooperation to ensure the elimination of hurdles in financing and institutional channels. The challenges include creating common procedures for fund disbursement, decisions on which institutions will oversee project selection and implementation, and rules for project monitoring and evaluation. At the same time, triangular cooperation is unique in that it should allow all partner countries to manoeuvre flexibly, presenting diverse perspectives toward a common goal of coordination. This flexibility is meant to provide space to move away from hierarchical donor-recipient modalities. Lastly, to optimise triangular arrangements, the approach will ideally go beyond government engagement. Therefore, questions arise on how India will formalise its engagements while maintaining space for all partners to meet their needs. Further, the increasing role of the private sector, sub-national governments and non-government organisations will have to be explored.

Triangular cooperation holds significant promise as a mechanism for accelerating climate action in the Global South. India, with its experience, expertise, and growing global stature, is uniquely positioned to be a leading force in this endeavour. This paper argues for more empirical studies to guide the creation of effective policy and build stronger domestic capacity to engage in alternate paradigms of development in emerging economies like India. By addressing the key research questions outlined in this paper and implementing the policy recommendations, India can unlock the full potential of triangular climate cooperation, solidify its role as a global climate leader, and contribute meaningfully to a more sustainable future for all. This discussion paper raises these questions to contribute to the evidence on improving global cooperation around climate change and to showcase how newer models of cooperation need to be better understood with evidence from developing countries.

1. Introduction

Addressing the challenge of climate change is a collective action problem that requires tremendous, coordinated global policy measures to decarbonise existing economic systems (Keohane & Victor, 2016). The first Global Stocktake indicates that the implementation of policies under Nationally Determined Commitments, are inadequate to keep global warming below 2°C (Dubash, 2023). One of the reasons could be because existing structures of cooperation, particularly those which solely emphasise North-South channels of resource transfer, have proved ineffective in catalysing required momentum, political will, and finance to enable rapid climate action (Iqbal & Pierson, 2017). Recognition of the limitations of governance focused on the United Nations Framework Convention for Climate Change (UNFCCC) requires rethinking climate cooperation models. Triangular cooperation, an existing modality which has been largely unexplored for its potential for improved climate action, is now gaining prominence as an alternative paradigm. Triangular cooperation has different definitions; however, in this paper I use the concept as cooperation between two developing countries facilitated by a multilateral agency or industrialised country. Triangular cooperation, which enables Southern-led partnerships with the support of Northern partners, could lead to a more collaborative and joint effort towards meeting global climate goals (Ramamurthi, 2023).

India has been a partner in triangular projects since the 1950s, beginning with road and telecommunication projects in Nepal with the United States of America (USA). In the early 2000s, the Indian Council of Medical Research (ICMR) and the German Helmholtz Association jointly conducted research to combat infectious diseases in African and Asian countries. In the late 2000s, India worked with Switzerland on decarbonisation projects in Bangladesh and Cuba. These are amongst a few examples of past cooperation; however, these projects have tended to be ad-hoc arrangements where donor countries have found India suitable to provide one-off capacity building exercises, community engagement, and infrastructure services. More recently since 2014, India has signed a flurry of longer-term programmatic triangular agreements with the United Kingdom (UK), USA, France, Germany, and the United Nations (UN). Notably all these agreements place tackling energy and climate challenges as a vital sector for joint effort (Ramamurthi, 2023).

As triangular climate cooperation gains more traction in India, effective institutional and policy channels for decision-making will be required from all partner countries. Yet, existing literature on triangular climate cooperation tends to be from the perspective of donor partners—multilateral agencies and industrialised countries. These papers focus on how donors can build stronger partnerships and navigate the channels of engagement with countries in the Global South (Casado-Asensio, et al., 2019). There is a lack of empirical studies rooted in the perspectives of Global South partners such as India, who are key in jointly financing, implementing, and building institutional channels for triangular cooperation. As India expands its ambitions in climate diplomacy, this paper highlights the need to tackle this existing knowledge gap and emphasises the importance of empirical evidence to build robust policy mechanisms for cooperation in the Global South.

This discussion paper outlines the evolving nature of present regimes of climate governance and the limitations and opportunities for triangular cooperation in climate governance. It then takes a deep dive into India's potential to be a leader in addressing climate change and energy challenges through triangular agreements. The paper illustrates sectors of climate action where India has been an innovator of appropriate technologies and policies suitable for transfer to other countries in the Global South. Finally, the paper concludes by calling for a research agenda that focuses on understanding the motivations for India and its partners to participate in triangular climate cooperation, the sectors and regions the country should focus on, and a need for a policy roadmap for India to successfully showcase its climate leadership in triangular partnerships.

2. Climate Governance in Regimes of Evolving Global Cooperation

Historically, the Global North has exerted undue influence on regimes of global governance, particularly while shaping norms, institutional mechanisms, and agendas for international cooperation (Mawdsley, 2018a). This has resulted in a donor-recipient system where finance flows, knowledge sharing, and technology transfer mechanisms are dominated by North-South channels (Urban, 2018). However, this paradigm is increasingly being viewed as insufficient

for developing countries to catalyse and implement cost-effective, appropriate solutions for sustainable development (Alonso & Santander, 2022). As seen recently during the pandemic, existing systems of global governance are not necessarily equitable or effective, particularly to the needs of countries that need the most assistance (Nauta, 2022).

The evolving nature of global governance is particularly apparent in climate change diplomacy, where traditional powers have not been able to unilaterally make decisions without accounting for the interests of developing countries (Larson & Shevchenko, 2015). First, the emergence of "rising powers"—developing countries with growing global influence—has led to a heterogeneous Global South that has resulted in a complex, evolving, multipolar, polycentric landscape. While large middle-income industrialising countries such as China, South Africa, India, and Brazil are reluctant to rapidly decarbonise, small island nations and least developed countries (LDCs) want urgent climate action as they face the most immediate and harshest impacts of climate change (Hurrell & Sengupta, 2012). Within the Northern bloc, strong pro-climate change stances are taken by the European Union (EU) and the UK, who have committed to reducing domestic emissions by 55 and 68 per cent, respectively, by 2030 (Moss, 2020). On the other hand, countries like Australia and the US have often been reluctant to wholly participate in this agenda, making them unreliable climate partners. In 2020, the US officially exited the Paris Agreement, with the Trump administration arguing that the agreement undermined the country's economy (Wagner & Allan, 2020). Australia is one of the world's only developed countries which remains committed to its coal resources, continuing exports under business as usual as well as approving new projects (Moss, 2020).

The concept of "common but differentiated responsibilities" is enshrined in climate negotiations. Essentially, all countries have a responsibility to meet global climate goals but can do so based on respective capabilities and not at the cost of national development (Centre for International Sustainable Development Law, 2002). This arrangement is ideal in theory as it is a fair and equitable understanding of climate justice, but in reality, calls for considerable transfers of finance and technology from the North to the South. However, these transfers have been woefully inadequate, and financing has fallen short of the annual USD 100 billion pledge made by developed countries in 2009. Further, this funding mainly comes in the form of loans and not grants, leaving poorer countries in debt (Timperley, 2021). When the developed world suggests that large emerging economies take more financial responsibility, there is pushback with accusations that the North wants to renegotiate previous finance agreements (Thompson, 2016). At the same time, developing countries are not completely willing to forego the historical responsibility of the North (Hurri, 2023). This shows that while there are no unified stances by the North-South blocs, there is a "blurring" between who is willing to take up climate leadership.

Second, today's growing geopolitical competition calls for a rethinking of how present cooperation around technology transfer occurs. An increasing tendency towards protectionism compounded by geopolitical tensions has meant that there is uncertainty in Northern leadership towards climate cooperation. The principles enshrined in the UNFCCC that focus heavily on technology transfer and deployment mechanisms for climate mitigation and adaptation have seen limited success (De Coninck & Sagar, 2015). Kirscherr and Urban (2018) show that only one-third of North-South technology transfer projects are successful and are driven mainly by adequate domestic policies and capacity in the recipient country. This has resulted in a fundamental shift in how decarbonisation is viewed, where economic opportunities for green economies are starting to be prioritised over objectives towards achieving a global public good of limiting temperature rise to below 2°C levels. This is in line with literature that studies the broader changes in trends of development cooperation (Mawdsley, 2018b). These efforts will have spill-over effects where countries in the Global South have to start thinking of alternative paradigms to ensure easy and affordable access to materials and technologies required for domestic climate transitions (Downs et al., 2023).

Finally, climate governance does not only foresee a recalibration in how Northern donors engage with different countries in the Global South. It also means that rising powers have experiences from their developmental processes that maybe better suited for developing countries compared to Northern solutions (Mawdsley, 2018; Alonso & Santander, 2022). As de Coninck and Bhasin (2015) state, technology transfer for climate change goes beyond merely physical hardware but rather is a complex phenomenon

Box 1: Transfer of Off-grid Solar PV from India to Kenya

The Off-Grid Solar PV Applications Programme is one of the oldest schemes within the Ministry of New and Renewable Energy (MNRE) in India. The programme, which was started in 2010, initially emphasised the role of off-grid solar energy to meet gaps in electrification, primarily in rural areas. The last phase of the programme, between 2018–2021, was rolled out once electrification improved in Indian villages and continued to focus on decentralised solar power applications such as water pumping and street lighting. Today, most off-grid schemes have been subsumed under the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan[1] (PM KUSUM), which focuses on overall farmer welfare (Ministry of New and Renewable Energy, n.d.).

India's early attempts at using solar energy for off-grid applications have resulted in the country developing a robust policy framework, regulatory and financial mechanisms for market penetration, after-sales service, and consumer awareness (Palit, 2013). Ulrud et al. (2018) highlight how experiences in West Bengal, dealing with the implementation of 17 decentralised solar projects in the Sundarbans, motivated a transfer of Indian systems to Kenya. Guided by the knowledge and technology expertise of the West Bengal Renewable Energy Development Agency (WBREDA), the University of Oslo implemented a solar mini-grid project in rural Kenya with a team of practitioners and grassroot community organisations in both countries in 2012. Kenya, with relatively less experience in mini-grid solar solutions but with active interest in renewable electricity, could jointly implement a demonstration project with their Indian counterparts.

Ulsrud et al. (2018) state that the key learnings from the Indian example allowed for understanding which factors would be most important while carrying out a socio-technical assessment in the Kenyan village. This allowed for the transfer of knowledge and technology, while at the same time co-creating solutions relevant to a different geography. This initial pilot project then led to a larger window of opportunity between the Indian and Kenyan governments to explore more solar options such as off-setting diesel costs with solar power, lantern renting, and phone charging.

The key learnings from this project indicate that transfer of innovations can only happen when there is bottom-up interest from the recipient country, who are willing to jointly experiment and take up ownership. At the same time, Indian counterparts were able to gain experience on how to be flexible in adapting their technology to a different context. Lastly, this project shows that there are certain sectors in which technology transfer between countries in the Global South is more effective than North-South transfers. However, donor countries can play a strong role in facilitating the platforms and resources which allow for technology transfer. Finally, the mandate of state agencies such as WBREDA remains domestic, making it hard for them to put in the resources to implement their solutions in a third country. Western agencies and research organisations may have strong networks in the Global South countries, and be able to provide institutional and financial support for Indian solutions to be implemented abroad.

[1] The PM-Kusum (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) aims to provide energy security to farmers, by setting renewable energy agricultural solutions including grid-connected solar pumps, stand-alone solar pumps, and decentralised grid connected power plants on arid land. It includes financial assistance such as state and central subsidies, or incentive based schemes per unit of electricity when procuring electricity from these sources (Ministry of New and Renewable Energy, n.d.).

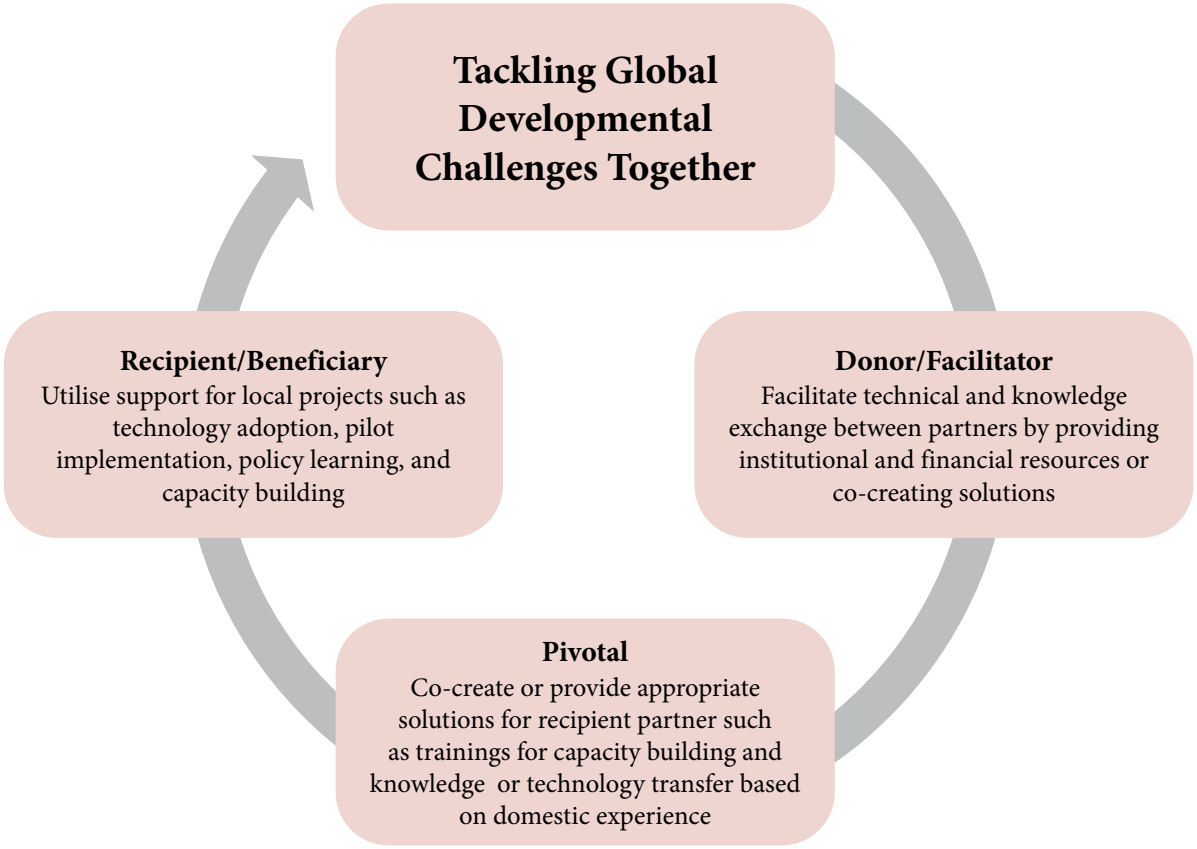
that involves a "fabric of capabilities, institutions, connections, networks, policies, and cultures that are an inalienable part of any strategy". Developing countries often face similar climate vulnerabilities and socio-economic contexts, which could make South-South expertise sharing and technology learning more effective than North-South transfers. Similar geographical conditions may require specific agricultural interventions, off-grid energy, or disaster management solutions. Cultural differences such as individualism vs more community-oriented societies may require policy and financial innovations which vary across countries. While developing countries often possess relevant expertise, they may lack the robust domestic capacity needed to build strategic partnerships and establish effective platforms and institutions for knowledge and technology transfer (Ramamurthi, 2023). Therefore, Northern donors and multilateral organisations—with their decades of experience in institutionalising development efforts and creating global networks—still have a vital role to play in facilitating South-South cooperation (Zoccal, 2020b).

3. Triangular Cooperation to Bridge the Gaps in Climate Governance

There is growing awareness that developmental challenges like climate change are more complex and difficult to address than previously understood. This complexity is creating a gap between the way donor agencies currently operate, and the approaches needed to effectively tackle these challenges (Ramalingam, n.d.). Climate change, unlike other global challenges of education and health, requires a number of specific measures to be taken across multiple sectors, including but not limited to agriculture, energy, forestry, marine ecosystems, urbanisation, buildings and industry. Such complex problems need to be met with appropriate context-specific solutions at multiple fronts that reflect the changing requirements of developing countries. Moving away from typical narratives of North-South gridlocks, climate transitions can benefit from equal partnership and mutual appreciation of progress between the North and South (Frischmann et al., 2022). In fact, studies show that support for climate action increases with improved norms of reciprocity and even burden sharing amongst countries (Gampfer et al., 2014; Bechtel & Kenneth, 2013). Triangular cooperation, which enables Southern-led partnerships with the support of Northern donors, holds potential for a more collaborative and joint effort towards meeting global climate goals.

There are often different understandings of triangular cooperation and its associated modalities. In this paper, I use the United Nations definition, which takes place between two developing countries facilitated by a multilateral agency or industrialised country, as shown in Figure 1 (Alonso & Santander, 2022; Casado-Asensio, et al., 2019; Hosono, 2013). Under this modality, there is the concept of donor, pivotal, and recipient partners. The donor partner facilitates technical and development exchange between and helps the pivotal partner in co-creating a low-carbon solution or provides resources necessary for existing solutions to be transferred to a third country. Often the pivotal and the donor partner have a strong relationship through previous bilateral interactions, while the pivotal and recipient partner share similar linguistic, colonial, or cultural contexts (Farias, 2015; McEwan & Mawdsley, 2012). The Organisation for Economic Co-operation and Development (OECD) uses triangular cooperation more loosely between any three actors that fulfil the role of pivotal, donor and recipient country. However, my work highlights the importance of Southern-led partnerships, rather than multi-stakeholder partnerships.

Figure 1: Triangular Cooperation



Source: Compiled by author.

Box 2: The Evolution of Triangular Cooperation

North-South dialogue has tended to dominate development discussions, including discourse around climate change. This is because it is perceived that Northern donors are historically responsible for many of the current challenges being faced by developing countries. Further, it was previously believed that developing countries lacked the resources, institutional capacity, and political will needed to effectively support the growth of other developing countries (Venkatachalam & Modi, 2024; Nkala & Kim, 2022). However, with the strengthening of South-South cooperation, and the shared experiences of developing countries, triangular cooperation started to emerge as a viable concept of engagement. One-off and fragmented triangular cooperation, often not under that label, has been practised since the 1950s in some form. The first explicit, formalised mention at a global forum was during the Buenos Aires Plan of Action (BAPA) in 1978. More recently, with an evolving geopolitical context, discourse around triangular cooperation has been increasing and was mentioned 73 times in 2019 at BAPA 40+ to commemorate forty years since the first meeting (Zoccal, 2020a; Haug, 2023). This conference also stressed the importance of triangular cooperation to meet climate goals and the 2030 Agenda for Sustainable Development (Paulo, 2021).

The initial engagements were usually aimed at using regional partners, such as India, in assisting projects in neighbouring countries. While India would provide services like human resources and local know-how, funding, execution, and planning of projects would be led by the donor country. However, the recent triangular cooperation agreements aim to put partner countries on an equal footing. This indicates the evolving nature of triangular cooperation, where the roles among different partners are becoming more fluid, perhaps leading to more horizontal and informal spaces for development cooperation.

Casado-Asensio et al. (2019) show that despite an emerging interest in climate action under triangular arrangements, the number of projects continues to be low. Further, national green policies rarely mention triangular cooperation as a mechanism to address climate change, as the focus has primarily been on multilateral forums such as the UNFCCC or bilateral agreements. The key challenges towards scaling up triangular efforts include a low-level of awareness and limited exposure to evidence of the success of this modality and the lack of dedicated platforms to facilitate cooperation. Further, most international organisations and multilateral banks driving climate action do not have well-established platforms to coordinate triangular projects. This is a missed opportunity, as scaling up this modality in global climate regimes could provide the following advantages:

Leveraging strengths of all partners

Shying away from donor-recipient paradigms of development, the concept of triangular cooperation does not delink responsibility from developed countries. Rather, in theory, it should allow for the strengths and innovations of countries to be scaled up to address challenges on an equal playing field. Developing countries can exchange cost-effective and appropriate policy, financial, and technological solutions, benefiting from the robust administrative, institutional, monitoring, and financial capabilities of Northern agencies (Casado-Asensio et al., 2019). It provides countries that have had similar development experiences the opportunity to pass on their knowledge to other countries making the same transition. This is essential in the field of climate change, where solutions tend to be context-specific but need to be implemented rapidly at scale. An example is the agreement between the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and India of USD 1 million to transfer early warning disaster systems in the Asia-Pacific region, focusing on climate adaptation (MEA, 2015). ESCAP is an established multilateral organisation that, amongst other areas, works on technical assistance and capacity-building services across the Asia-Pacific region, including in disaster risk resilience (ESCAP, n.d.). Such agreements leverage the strengths of India—the pivotal country—in domestic disaster management innovation while using existing multilateral channels of ESCAP to work in countries with which India does not typically have strong bilateral development cooperation experience.

Partnership and network building

Often international cooperation tends to be intra-regional rather than inter-regional (Casado-Asensio et al., 2019). Triangular cooperation gives an opportunity for countries and regions that typically do not engage in cooperation with each other to form connections. It also provides the possibility for actors to form better alliances, build trust, and strengthen networks (Abdenur, 2006). These aspects of triangular cooperation are well-suited to finding sustainable climate solutions, as often countries in geographically distant regions may face similar challenges. An example is that of a project facilitated by Germany which helped Costa Rica transfer experience on sustainable forest management to Morocco (Alonso & Santander, 2022). Costa Rica and Morocco do not historically have strong ties to each other, or engage on cooperation, but through the facilitation of the German government were able to co-create solutions for a global common good. Finally, triangular cooperation is also suited for long-term, durable collaborations if implemented programmatically. In terms of climate solutions, this could mean that a donor country assists a pivotal country in institutionalising centres of excellence or research institutes, which then work on transferring technologies to third countries. Japan assisted Brazil's Agricultural Research Corporation (Embrapa) in developing a new strain of soya beans that could be grown in the tropical savannah regions of the country. This project was considered a great success, and the Brazilian Agricultural Research Corporation in turn began to help other countries, such as Mozambique, in developing similar crops for their climates (Hosono, 2013).

Institutional benefits and low-cost implementation

Triangular cooperation could provide institutional advantages compared to traditional mechanisms of technology transfer and knowledge sharing currently practised in multilateral agencies. It could lead to more flexibility in pursuing innovative solutions, taking into consideration the value addition of each partner, particularly accessing the experience of the pivotal partner. This means that development outcomes can be met more cheaply in terms of services such as capacity building or technology transfer (Mawdsley & McEwan, 2012). Cheap and effective solutions are key to climate action, where the existing global financing landscape is currently inadequate. The comparatively lower costs of technology procurement and human resources from countries in

the Global South, can lead to increased efficiency of development finance compared to direct implementation by industrialised countries. Developing countries engaged in triangular cooperation may not be eligible for Official Development Assistance (ODA) but could still benefit from the support and collaboration on climate change from other countries. For instance, in the agreements signed between India and the UK, France, US, and Germany, India is always referred to as a partner to address global challenges with shared values and a vision in the developing world. As perceptions of developed countries towards India change from that of a recipient to a contributor to solving global issues, countries want to continue to be engaged to shape a global world order that still upholds their vision of prosperity, global commons, and governance (MEA, 2021; MEA, 2022; MEA, 2023; USAID, 2016). Pivotal countries can use these platforms for reputation building, strengthening their domestic institutions for cooperation, and showcase their domestic low-carbon innovations globally at scale. This is seen in the case of the triangular platform, the International Solar Alliance (ISA), created by India and France as an outcome of the Conference of Parties in Paris. The ISA facilitates the transfer of India's policies for strengthening institutional, financial, and regulatory environments to promote solar energy in third countries. India uses triangular platforms like the ISA to create a reputation as a country which is attempting to "reshape" the narratives and institutions around global development (Jha, 2023; Paulo, 2021). This allows India to showcase itself as a development partner that prioritises the concerns of developing nations. At the same time, India can create inclusive, bottom-up institutions. These institutions engage with a diverse range of stakeholders, including civil society, sub-national governments, and private entities. This also helps India build stronger alliances and cultivate a reputation as a trustworthy and horizontal partner.

4. The Bridging Role of Rising Powers: The Case of India

Identifying the right pivotal partner in triangular cooperation is key, as they are the point of (co-)creation of policy and technology innovations, provide capacity building, and have successful experiences in their own domestic development trajectory that can be replicated in other contexts.

During its G20 presidency, India announced ambitions to champion the cause of the Global South. India has also been creating institutional channels that allow for knowledge and experience sharing between developing countries, such as the Global South Centre of Excellence—Development and Knowledge Sharing Initiative (DAKSHIN) (DAKSHIN, n.d.).[2] At the same time, it has continued to create stronger economic and geopolitical ties with its Western counterparts. India is also viewed as the natural partner to tackle the growing influence of China in development cooperation (Paulo, 2021). By making ambitious domestic goals towards renewable energy and human-centric approaches towards sustainability, as envisaged under the Lifestyle for Environment (LiFE) scheme (NITI Aayog, n.d.),[3] India is signalling that it wants to take a leadership role in climate change. It is witnessing a growth of technological, policy, and financing innovations, leading to localised solutions for climate mitigation and adaptation. The country has important development experiences in sectors ranging from smart agriculture, decentralised and large-scale renewable energy deployment, disaster management systems, and climate-resilient infrastructure (see Boxes 1 and 3–4) (The Asia Foundation, n.d.).

The above-mentioned factors make India—an emerging economy with a rapidly growing global influence—a well-suited bridging partner between the Global North and South in climate cooperation. It thus becomes interesting to understand the role that India can play in triangular cooperation for better climate action.

[2] Dakshin was launched in November 2023 and is meant to focus on studying developmental issues in the Global South. The centre is housed within the Research and Information System for Developing Countries (RIS), an autonomous think tank that works closely with the Ministry of External Affairs (MEA). Its activities till date involve organising webinars, visits from Global South researchers and internship opportunities. There are no publications or white papers out from the Centre on its activities and on the impact of its research.

[3] LiFE was launched in 2022 as a movement to target the public on low-consumption lifestyles. The initiative appears to be primarily aimed at providing information and awareness to consumers on how to have a lower carbon footprint through outreach activities and Mission LiFE portal. In 2023, the Ministry of Environment, Forest, and Climate Change (MoEFCC) conducted about 7-8 monthly community-level events for students and citizens on themes such as water conservations, plastic reduction, and adoption of sustainable food systems. Data for activities in 2024 are unavailable as of now (Ministry of Environment, Forest and Climate Change, n.d).

Box 3: India's Experience with Climate Smart Agriculture

Moscana and Sastry (2022) highlight the importance of appropriate innovation and technology use in the agricultural sector. They argue that the use of inappropriate technology developed in industrialised nations, such as innovation for pest management, results in up to a ~60 per cent reduction in crop productivity (Moscana & Sastry, 2022). It is, therefore, extremely important to make sure that agricultural solutions and innovations developed in the Global South with similar geographical and climatic conditions are shared with each other.

India has been early to create policy institutions to combat the impact that climate change is going to have on agricultural growth, creating the National Initiative (recently rebranded as Innovations) on Climate Resilient Agriculture (NICRA)[4] in 2011. Under the National Adaptation Fund for Climate Change (NAFCC), started in 2015, National Bank for Agriculture and Rural Development (NABARD) provides financing for innovation for climate-resilient agriculture. Since 2015, the government has sanctioned 847.5 crore rupees on various projects including restoration of degraded land, water conservation, climate resilient agriculture, and rehabilitation of coastal areas (National Bank for Agriculture and Rural Development, n.d.). This has resulted in a multi-stakeholder ecosystem where grassroot civil societies, the private sector, and government actors have gained experience in climate-smart agriculture.

Government backed Centres of Excellence such as the National Institute of Agricultural Extension Management (MANAGE) and Indian Institute of Millets Research (IIMR) work to improve agricultural practices in several key areas: cultivating climate-tolerant species such as millet and sorghum, integrating gender-responsiveness into climate-smart agriculture, promoting better land and water management practices, and encouraging crop diversification. Private innovation has stemmed from the use of digitalisation in agriculture by companies like Digital Green[5] and CropIn.[6] These companies focus on areas such as artificial intelligence to provide effective weather forecasts and advisories, improving data collection on mechanisation, and advisories on precision agriculture. These government agencies and companies already engage in projects in Africa, such as Tanzania and Ethiopia, and in Southeast Asia, such as Vietnam and Cambodia. Integrating these actors into a climate-smart focus for India's triangular cooperation could help promote these innovations on a larger scale with more effective institutional mechanisms (The Asia Foundation, 2022a).

5. India's Approach to Triangular Climate Cooperation: A Research Agenda

Typically, scholars have branded India as reluctant to participate in international agreements and institutions that provide global public goods and ask the country to bear more global responsibility. In climate negotiations, Western countries have often called India a naysayer, only engaging in international cooperation mechanisms when it suits its narrow national interests (Jha, 2023). In practice, Nachiappan (2019) and Sidhu et al. (2013) find that India is a "rule shaper", negotiating in multilateralism after taking into consideration its domestic interests, insti-

[4] Launched in 2011 with a budget of INR 350 crores, the scheme comes under the Indian Council of Agricultural Research (ICAR) and aims to increase the resilience of Indian agriculture to climate change by demonstrating technology, research, capacity building, and financial grants. Sectors include livestock, fisheries, crop agriculture, and resource management. The initiative remains active with 21 projects sanctioned for the period of 2021-2026 (Indian Council of Agricultural Research, n.d.).

[5] Digital Green, since 2008 uses Artificial Intelligence (AI) technology to promote climate smart agriculture and cost-effective interventions to agriculture to improve crop yields, increased income, and costs of production. Through their AI platform, they produce instructional and informational content to farmers in countries like India, Kenya, and Ethiopia for climate smart agriculture (Digital Green, n.d.).

[6] CropIn is a real-time, AI platform that uses big data to improve agricultural productivity across the supply chain, with projects such as using remote sensing for pest control, digitisation, monitoring of farming activities, and financial planning of farmer cooperatives (CropIn, n.d.).

tutional priorities, and capacity to engage. Using the example of India's approach to the Rio UNFCCC in 1992, Nachiappan (2019) shows how India's defensive strategy actually assisted developing countries by putting the focus on equity and financial transfers.

More recently, in the sphere of climate-related issues, India has even sought to emerge as a leader, creating institutions such as the ISA and the Coalition for Disaster Resilient Infrastructure (CDRI) (refer Box 4) to bring together countries onto one platform (Jha, 2023). This discussion paper highlights how triangular cooperation is another lens through which India's stances in international cooperation can be understood. Does India play a passive role in such agreements, merely facilitating the agenda of donor countries? Or does India actively shape the climate agenda in these arrangements, bringing to the table financial and technical norms, standards, and resources? If so, what are the factors that drive India to navigate triangular arrangements, and what are their interests in doing so?

Despite being no stranger to triangular cooperation and engaging more with the international community on climate change in recent years, India does not feature as one of the top countries to carry out green triangular projects (Casado-Asensio et al., 2019). India has the potential to be acknowledged as a credible pivotal partner that provides innovative and scalable solutions to the Global South to tackle climate change, if it so wishes. However, policymakers in the country need to navigate the following issues while formulating their strategies for global climate cooperation:

Unpacking the role of triangular cooperation in India's climate diplomacy

Post-Paris, India has emerged as an important voice in climate diplomacy, actively engaging with established global governance structures, as well as creating alternative frameworks to drive its interests. As the country navigates international regimes of climate governance, we see India working within multilateral, minilateral, triangular, and bilateral channels to meet its agendas (Xavier & Nachiappan, 2023). Over the past decade, triangular cooperation has seen renewed focus with a strong climate and energy dimension (Ramamurthi, 2023). Yet, India's approach towards triangular arrangements is understudied, particularly as a growing channel in an ever-evolving arena of climate diplomacy.

India is a donor to the United Nations Development Programme (UNDP). In 2017, India pledged USD 150 million over a span of 10 years to the India-UN Fund to implement projects across the developing world. A quarter of these projects focus on renewable energy and climate resilience (UNOSSC, n.d.). India has actively engaged in triangular arrangements for energy and climate in programmatic agreements with the UN, Germany, the UK, and the US (Table 1). Last year, France and India released a roadmap for long-term collaborative efforts in the Indo-Pacific highlighting climate-resilient infrastructure and the blue economy (MEA, 2023). India's reach on climate action via triangular cooperation extends to Latin America, Africa, the Indo-Pacific, and the South Asian neighbourhood (Ramamurthi, 2023). India's triangular efforts have been both at the macro level, creating "platforms" for cooperation such as the ISA and the CDRI. At the same time, India has also pioneered triangular micro-initiatives at the grassroot, community level such as the training of solar engineers in African countries by the Barefoot College, a non-governmental organisation (NGO) based in Rajasthan (Magistretti, 2019). As a starting point, it is important to understand what motivates India to participate in these triangular arrangements for climate action. While literature states strengthening alliances, reputation building, improving soft power, and accessing resources as possible reasons for triangular arrangements (Alonso & Santander, 2022), empirical evidence in the Indian context is scarce.

Table 1: India's Triangular Partnerships

Partner	Partnership	Status	Projects carried out
USA	Triangular Development Partnership (TriDep)	First amendment signed in 2014; Second amendment signed in 2021- extended up till 2026.	Capacity building and workshops on climate smart agriculture in Indonesia and the Philippines, telemedicine in Fiji and renewable energy in Tanzania.
UK	Statement of Intent on Partnership for Cooperation in Third Countries	Signed in 2015 up till 2020; subsumed under India-UK Global Innovation Partnership in 2022-2036.	Clean energy and modern energy access projects in Africa; since 2022, setting up the Innovation Fund, no projects on ground yet.
Japan	Asia- Africa Growth Corridor	Initiated in 2010; AAGC declaration in 2016.	Initiative unlikely to go forward.
Germany	Joint Declaration of Intent Partnership on Triangular Cooperation	Signed in 2022 up till 2025.	Four projects conducted related to agriculture, forestry and digitisation in Peru, Cameroon, Ghana, and Malawi in Phase 1. Planning for Phase 2.
France	Indo-Pacific Triangular Cooperation Fund	Announced in 2023.	Fund being set up, no projects on ground yet.
UN	India-UN Development Fund	Established in 2017.	66 projects been implemented. Approximately one-third of projects focus on sustainability, energy, and climate.
India-coalition of founding members	Coalition for Disaster Resilient Infrastructure	Founded in 2019. Headquarters in New Delhi with 31 countries, 2 multilaterals, and 6 private organisations as members.	Fellowships, reports to assess climate risk, and resilience strategies for infrastructure in different countries; knowledge exchange initiatives.
India-France	International Solar Alliance	Founded in 2015. Headquarters in New Delhi with 117 member countries.	Capacity building, technology demonstration, analytics, and advocacy projects.

Source: Compiled by author.

It is important to know which regions India is keen to engage with, the scale of projects, and what technologies are seen as most suited for transfer. Currently, the climate and energy projects that India has undertaken through triangular cooperation remain small-scale, primarily targeted at low-income countries and small island nations. For instance, out of the total partner countries in the India-UN Fund, 50 per cent are small island nations and 31 per cent are LDCs. These projects tend to be small-scale, such as the installation of 120 solar freezing units in 100 households in the Marshall Islands and providing access to 600 households through household solar systems (UNOSSC, 2023).

Is India's strategy regarding triangular cooperation going to continue to focus on small-scale, decentralised solutions, or is there scope to use established channels to make more impactful, scalable institutional and regulatory knowledge transfers? Climate transitions require scale and implementation at a relatively fast pace. While India's efforts on small-scale solutions are commendable, it may aim to provide larger-scale knowledge transfer based on its own experiences to other rapidly growing economies. Domestically, India has managed to create financial, regulatory, and technological mechanisms to ensure the Green Revolution, growth in renewable energy,

Box 4: India as a Knowledge Hub for Climate Adaptation and Resilient Infrastructure

India's geographical context implies that it is prone to a variety of extreme weather events, including floods, landslides, earthquakes, sea-level rise, cyclones, heatwaves, wildfires, and droughts. Previously, India's approach towards disaster management was geared towards reacting to crises, as opposed to being responsive. This resulted in loss of life and property around two decades ago with the Super Cyclone in Odisha, the Gujarat earthquake, and the 2004 tsunami on the coastline. Since then, India has come a long way in developing early warning disaster management systems and resilient infrastructure to minimise loss (The Asia Foundation, 2022b). The advantages of transferring technology and institutional and capacity building knowledge from India to other developing countries include cost-effectiveness and past experiences in dealing with communities in similar socio-economic and cultural contexts.

India has several natural disaster management agencies at the national and sub-national levels. Scientific institutions have worked on a series of early warning systems, including for floods, tsunamis, cyclones, and landslides, amongst others. Triangular arrangements with the UN, the United States Agency for International Development (USAID), and the French government have a focus on disaster risk reduction. Climate resilience projects under the India-UN Fund have been implemented in seven Pacific Island countries as well as Fiji, Mozambique, and Antigua and Barbuda (UNOSSC, 2023).

CDRI is a "triangular platform" founded in 2019, with the Indian government contributing a grant of roughly USD 58 million. Similar to the International Solar Alliance, this platform, located in Delhi, was initiated by India, and is supported by industrialised countries and multilateral organisations. The project aims at promoting resilient infrastructure from disaster and climate risks, with a particular focus on Small Island Developing States (PIB, 2022). Currently chaired by India and France, this engagement is seen as an important collaborative attempt between the two countries to provide for and create a peaceful and secure Indo-Pacific (MEA, 2023).

and energy efficiency schemes. More recently, India's reverse bidding and price determination mechanisms for renewable energy, cost-sharing schemes for electric vehicles, and digitalisation of energy services are a few notable examples. It is important to understand whether triangular cooperation can be a suitable channel for large-scale knowledge exchange and technology transfer.

Balancing formalisation, multiple stakeholders, and partner agency

Globally, poor standardisation and evaluation of projects is often cited as one of the key barriers to quantifying, scaling, and improving triangular cooperation. A lack of capacity and experience is also stated as a concern from donor countries engaging in triangular cooperation with pivotal and recipient countries (Haug, 2023). Triangular cooperation does not have a clear definition, and the modality is often subsumed under other development cooperation initiatives, making reporting under this mechanism hard to quantify. While the ISA is an example of triangular cooperation, projects under this mechanism are not reported as such within the OECD database because it doesn't fit their narrow definition of this modality. A similar situation is seen in India, where the extent of India's engagement is hard to understand, as the country does not explicitly report projects under the triangular label (Paulo, 2021). India, along with its partner countries, would benefit from creating guidelines, norms, and structured mechanisms around triangular cooperation to ensure the elimination of hurdles in financing and institutional channels. The hurdles include creating common procedures for fund disbursement, decisions on which institutions will oversee project selection and implementation, and rules for project monitoring and evaluation. Understanding how past projects have fared and adding to the evidence base of successes and failures of implementation is important to scale up and replicate green triangular arrangements (Casado-Asensio et al., 2019; Ramamurthi, 2023).

At the same time, Zoccal (2020b) argues that the lack of rigid rules and standards towards cooperation allows for spaces of dialogue that can focus on finding the most appropriate solutions to policy problems. Triangular cooperation is unique in that it should allow all partner countries to manoeuvre flexibly, presenting diverse perspectives toward a common goal

of coordination. This flexibility is meant to provide space to move away from hierarchical donor-recipient modalities. In practice, Haug (2023) states that the greater influence of donor and pivotal countries often leads to less agency for recipient countries. Further, Prabhu and Chakrabarty (2023) find that recipient countries can find it onerous to coordinate with two partners who often have greater resources and institutional capacity than them. Negotiations between donor and pivotal countries could overshadow the needs of recipient countries, leading to traditional hierarchical mechanisms of cooperation. The question then arises of how Indian policymakers and their partner countries can strengthen institutional mechanisms, frameworks, and norms for effective triangular cooperation without making these spaces inflexible or hierarchical for partner countries.

Lastly, to optimise triangular arrangements, the approach will ideally go beyond government engagement. Chaturvedi and Piefer-Söyler (2021) have highlighted the critical role that civil society plays in enabling low-cost, community-driven, low-carbon solutions in Indian triangular cooperation. In addition, the increase in private sector participation and entrepreneurship in India's domestic climate innovations means that this sector could play a larger role in triangular arrangements. India has been increasing its economic diplomacy particularly with Africa and Central, South, and Southeast Asia (Venkatachalam & Modi, 2024; Grossman, 2023; Mavlonov, 2023). Indian companies are actively engaging with their counterparts in the Global South, looking for economic opportunities both for large-scale industry and medium, small, and micro enterprises (MSMEs). The UK-India triangular partnership is based on the model of showcasing Indian innovation in a third country, focusing on sustainable development, thereby engaging more with green-tech start-ups (MEA, 2021).

Creating formal and informal spaces for non-state and sub-national actors to participate in triangular cooperation is crucial. India should work with its donor and recipient countries to facilitate such platforms. Networks of trust and cooperation can be fostered beyond state agencies by cultivating local ownership in recipient countries (The Asia Foundation, 2022). This requires a clear understanding of the role Indian policymakers envision for non-state and sub-national actors. How do these policymakers engage such actors in triangular cooperation? What platforms are being developed to better integrate community-level projects within Indian triangular cooperation?

Exploring channels of engagement

The channels and mechanisms through which India participates in climate and energy cooperation with partner countries merit further exploration. The traditional route has been to expand engagement with industrialised countries that India has strong bilateral relationships with by adding a recipient partner. A similar approach is seen with climate and energy projects where cooperation occurs among donor partners that India has a long history of development cooperation experience with such as Germany and the US. India is often used as a base to co-create solutions or develop domestic research capacity for climate action in the Global South (TERI, 2022).

Second, India works as a partner with multilateral agencies such as ESCAP and the UN to build specific funds and programmes. Engaging with multilateral agencies has advantages, including collaborating with a neutral agency that has established institutional capacity for cooperation. This allows India to engage with countries broadly across regions, rather than focusing on a particular region or country.

Third, the most innovative option has been for the country to spearhead global triangular platforms such as the ISA and CDRI. These platforms are unique in that they allow for cooperation to occur with India being at the forefront of project coordination, facilitation, and implementation. They allow government and non-government stakeholders from across the world to work together on a specific issue. Finding sector-specific solutions such as solar energy (ISA) or climate-resilient infrastructure (CDRI) focuses on targeted policies rather than programmes with vague mandates. Such platforms work to tackle multiple challenges in policy, including regulatory, institutional, and implementation barriers.

In summary, an effective triangular research agenda can aim to answer the following questions:

- What motivates India and partner countries to engage in triangular cooperation on climate and energy?
- What role does triangular cooperation play within India's climate diplomacy?
- What are the present definitions and institutional models for triangular cooperation?
- What should India's policies be towards building effective triangular partnerships for climate and energy?

6. Conclusion

Changes in the global governance landscape have resulted in the emergence of non-traditional methods of development cooperation to address the world's most pressing challenges. The need for improved climate finance, effective channels for the transfer of appropriate technologies, and increased leadership in international governance calls for alternative paradigms for effective climate action. Triangular cooperation is theorised to have increasing significance as a horizontal mechanism of even burden sharing, providing flexible spaces to find context-specific solutions particularly suited to the needs of recipient countries. In this discussion paper, I draw on literature to show that triangular cooperation has the potential to leverage the strengths of various countries, create strong inter-regional partnerships, and create robust institutional channels for cooperation. These benefits could make this modality particularly suited to handling issues such as climate change, where traditional North-South paradigms of knowledge and technology transfers as well as financing, are proving inadequate.

India, as a rising power, is thought to be a well-suited partner to play a bridging role between the North and South in triangular climate efforts. The country is increasingly engaged in domestic low-carbon innovation and positions itself as a climate leader in different arenas of global diplomacy. India has been active in placing a heavy emphasis on tackling mitigation and adaptation challenges in its triangular efforts. The sectors in which it has shared significant international experiences appear to be grid-connected and decentralised renewable energy, climate-resilient infrastructure, early warning disaster systems, and smart agriculture.

While scholarship on triangular cooperation has grown in recent years, empirical evidence to understand whether this modality adheres to principles of horizontality, recipient-guided solutions, and improved alliance building remains scarce. Further, existing evidence primarily emerges from the perspective of donors, rather than from pivotal and recipient partners. It becomes important to understand why a country like India, which has traditionally been reluctant to partner with Western donors, is actively turning to this form of cooperation.

I lay out a research agenda that places India's climate cooperation as a case to better understand how emerging countries engage in triangular efforts, drawing out the need for broader lessons on the motivations, mechanisms, and institutional processes. It is important to understand whether India plays an active or passive role in such agreements. Amongst different venues available for rising powers to engage in climate diplomacy, analysis on how triangular cooperation fits into the bigger picture is required. As India engages actively in climate diplomacy at multilateral, plurilateral, and bilateral platforms, the question arises of what benefits triangular cooperation poses for the country, and whether it fulfils any objectives that current forms of engagement are unable to meet. The partners that emerging countries choose to engage with, institutional channels, and the choice of technologies shared amongst countries are important insights to build stronger triangular efforts. Finally, studies are also needed on the role of civil society and the private sector domestically and in partner countries to create strong linkages for knowledge sharing and technology transfer.

There is a need to understand how triangular cooperation is defined from the Global South perspective, the formalisation of existing institutions, their effectiveness, and how partner countries perceive India's efforts. This paper also argues for more empirical studies to guide the creation of effective policy and build stronger domestic capacity to engage in alternate paradigms of development in emerging economies like India. Finally, more research is required to understand new channels through which India is strengthening relationships with the Global South, a key aspect of which can be triangular cooperation. This research agenda can be used to understand whether India is using this modality to learn from more experienced partners to strengthen domestic capacity and institutional frameworks for development cooperation. This discussion paper raises these questions to contribute to the evidence on improving global cooperation around climate change and to showcase how newer models of cooperation need to be better understood with evidence from developing countries.

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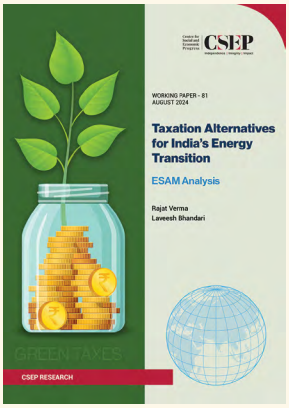
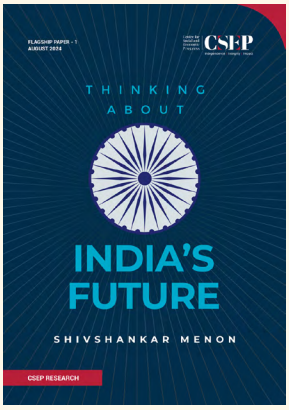
About the author

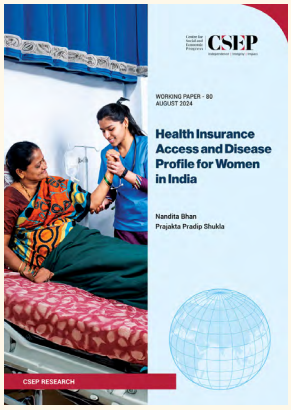
Pooja Vijay Ramamurthi has a PhD in Public Policy from the School of Public and International Affairs at Princeton University. She studies climate and energy transition policy, particularly focusing on the role that India can play in accelerating domestic and international action.

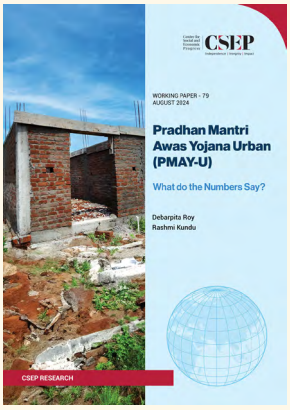
She has worked at the Energy Policy Institute at the University of Chicago and the Center for Study of Science, Technology and Policy. She was a recipient of the Prize Fellowship for Social Sciences at Princeton University. She has also received her double Master's degree in Sustainable Energy from the Royal institute of Technology, Sweden and Instituto Superior Tecnico, Portugal via the Innoenergy scholarship granted by the European Union.

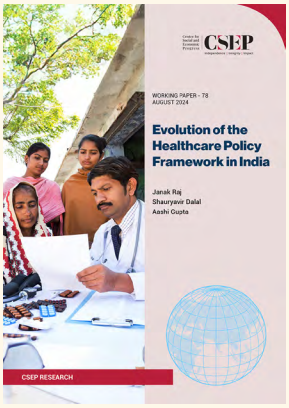
Other publications

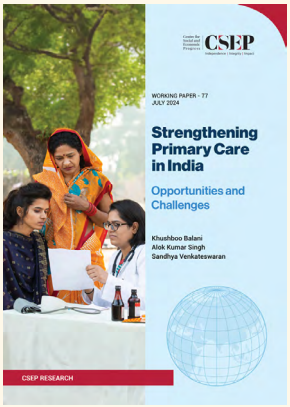


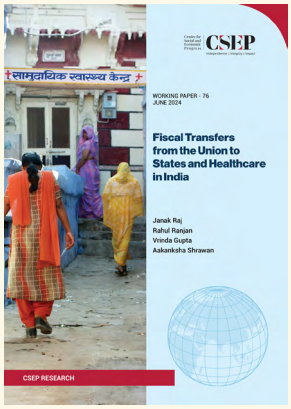


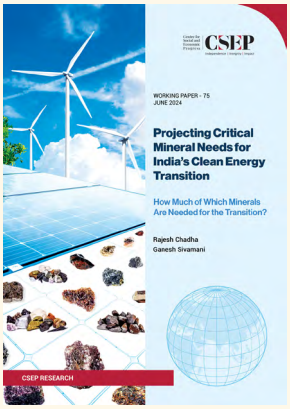


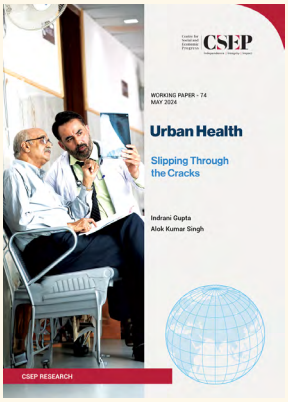


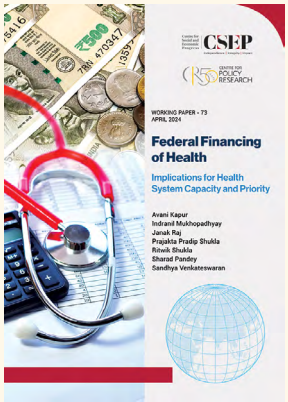


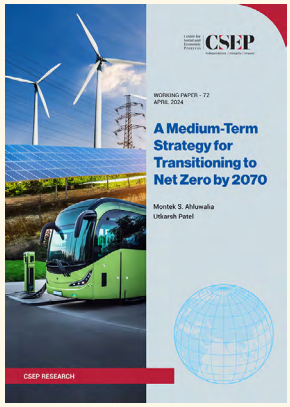


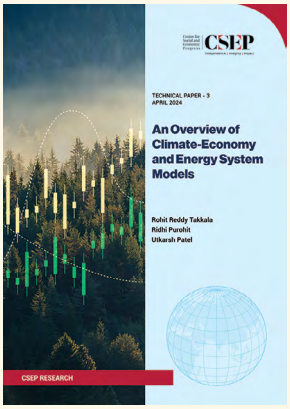


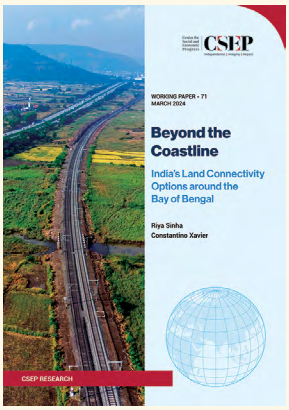


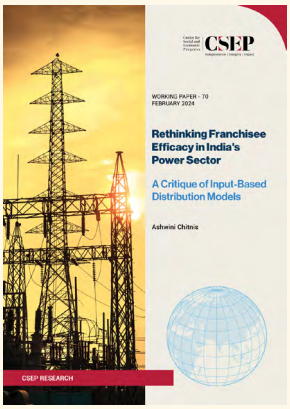


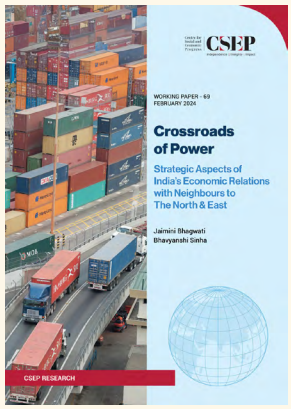


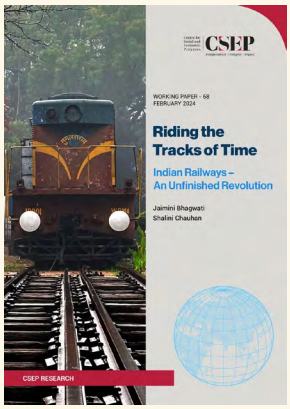












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