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EVIDENCE REVIEW ON MARKET-BASED APPROACHES TO MITIGATION AND ADAPTATION

Approach paper

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Evidence review on market-based approaches to mitigation and adaptation

APPROACH PAPER

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ABBREVIATIONS

Ci-Dev	World Bank's Carbon Initiative for Development
COP	Conference of Parties to the United Nations Framework Convention on Climate Change
CVM	Contingent valuation method
GCF	Green Climate Fund
IBWI	Index-based weather insurance
IEU	Independent Evaluation Unit, Green Climate Fund
NDC	Nationally determined contributions
PES	Payments for environmental services
PICO	Population, Interventions, Comparison, Outcomes
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RBP	Results-based payments
SR	Systematic review
ToC	Theory of change
USD	United States dollar
WTP	Willingness to pay

A. BACKGROUND

1. DESCRIPTION OF THE PROBLEM

A large gap exists between tracked climate finance flows and the investments needed for climate mitigation and adaptation. The twenty-sixth session of the Conference of the Parties (COP 26) in Glasgow in 2021 continued efforts to stabilize temperature increases to 1.5 degrees by establishing a work programme in mitigation to increase scale and implementation. COP 26 also saw the creation of an annual high level ministerial roundtable to help set the global direction on pre-2030 mitigation ambition[2]. Importantly, COP 26 completed the rulebook for the Paris Agreement (signed in 2015), including common time frames, methodologies and modalities for emission reduction targets through nationally determined contributions (NDCs). The rulebook supports the aim of delivering USD 100 billion in annual climate finance by 2023 and creating a three-year process for a collective, quantified target for climate finance post 2025.

Currently, global mitigation investment is considerably lower than needed to limit global warming to 1.5 degrees (Naran and others, 2022). Recent comprehensive estimates of global climate financing suggest a range of USD 620 to 640 billion of tracked mitigation and adaptation domestic and international flows in 2019 and 2020, respectively. This is less than a fifth of what is required throughout this decade, considering the necessary financial flows will increase from USD 3 trillion to USD 4 trillion through this period. Currently, 90-93 per cent of all tracked climate finance flows target mitigation purposes, with the remaining proportion split between adaptation and dual purposes. Almost half of the climate flows were in East Asia (Naran and others, 2022).

Just over half of current flows are from public actors, predominantly national and multilateral development finance institutions[3]. Globally, the balance of public and private investment varies considerably, with private flows dominating in Annex I countries, especially the US, and public flows dominating in non-Annex I Parties (especially sub-Saharan Africa). Due to the urgency of the climate challenge, the considerable mitigation finance gap, and limited fiscal space in many Annex I countries, the balance between public and private finance will likely change in coming years. For example, according to the International Monetary Fund, private finance must be doubled by 2030, and there is an urgent need to incentivize low-carbon and adaptation-focused investments through private financing mechanisms in emerging markets if global commitments are to be met (Ehlers and others, 2022).

The role of the Green Climate Fund (GCF) as the world's largest climate fund becomes instrumental in overcoming these challenges. The GCF is strongly positioned to mobilize action through its Governing Instrument. The instrument offers to house a "private sector facility that enables it to directly and indirectly finance private sector mitigation and adaptation activities at the national, regional and international levels" (Green Climate Fund, 2011, para. 41).

In response to the insufficient levels of climate finance in developing economies, the GCF can leverage its strong private sector focus to "promote the participation of private sector actors in developing countries, in particular local actors, including small- and medium-sized enterprises and

[2] COP 26 called on Parties to accelerate technological advancement and policy frameworks for mitigation, a phase down of unabated coal power and a phase-out of inefficient fossil fuel subsidies, alongside support for a just transition for the poorest and most vulnerable. The achievement of these aims is contingent on a clear and assured set of financial commitments. The first annual high level ministerial round table on pre-2030 ambition was held during the twenty-seventh session of the Conference of the Parties (COP 27) in Sharm el-Sheikh, Egypt.

[3] Considering 2019 and 2020 together, Naran and others (2022) estimates that 41 per cent of these flows were in the form of balance sheet financing, 36 per cent in project-level market-rate debt, 8 per cent project equity, and 7 per cent project debt on concessional terms. Only 6 per cent was in the form of grants, most of which flowed for adaptation purposes.

local financial intermediaries" (Green Climate Fund, 2011, para. 43). The GCF can achieve this by engaging the private sector in climate action by supporting new business models and raising awareness for projects and programmes that can generate returns for the private investors.

Among multilateral funds, the GCF is one of the best positioned for achieving this through its capacity to encourage innovative financing instruments and provide a capital base, incentivizing the private sector to invest in developing economies where barriers and risks to investment may lead to hesitancy and uncertainty. Furthermore, the Governing Instrument's focus on transparency and accountability supports the case for low-risk private sector investments helping close the global climate finance gap. Notably, the private sector facility's operation will be consistent with a country-driven approach (Green Climate Fund, 2011, para. 42). Moreover, the recently adopted Strategic Plan 2024-2027 for the GCF outlines a programming priority to increase the share of funding allocated through the private sector facility compared to GCF-1. The GCF will aim to catalyse climate finance from the wider finance ecosystem, including for local private sector early-stage ventures, micro-small- and medium-sized enterprises and national and regional financial institutions. Such an approach will seek to replicate innovative and inclusive interventions based, *inter alia*, on local, traditional and indigenous knowledge (Green Climate Fund, 2023).

The need for private sector investment, in combination with the GCF's mandate, means the Fund is well positioned to take a leading role in private sector climate finance. However, global evidence on key market-based approaches is scattered across different actors, silos and sectors. This evidence review highlights commonalities across selected market-based approaches to inform learning within the GCF and, more broadly, across the climate finance landscape. It aims to aggregate findings from studies included within existing systematic reviews and will synthesize these using qualitative methods. Through bespoke products and dissemination events, this review will contribute to greater awareness of how to enhance the origination and review of return-generating projects and programmes in the GCF and climate finance fields.

Specifically, the review will offer an in-depth analysis of the findings and the approaches taken, including a critical appraisal of the methods used to establish the evidence base. The review will consider all outcome areas relevant to mitigation and adaptation interventions. The Independent Evaluation Unit (IEU) of the GCF has identified four key market-based approaches that have significant potential to scale private sector climate action:

- Payments for environmental services (PES)
- Willingness to pay assessments (WTP)
- Index-based insurance
- Results-based payments (RBP)

Part 2 of this section provides a detailed overview of the market-based approaches, while part 3 explains the objectives of the evidence review. Section B presents the theory of change (ToC) relating to four market-based approaches, which the evidence review will aim to examine. Section B also presents the methods used to conduct the assignment. Section C provides insight into the search study, including databases that will be explored. Section D provides the data collection and analysis procedures. Section E presents the conclusions. The appendix includes the search terms for the evidence review.

2. MARKET-BASED APPROACHES

The four market-based approaches are presented below. We offer a definition and an overview from recent literature for each approach before summarizing findings from existing systematic reviews (SRs).

a. Payments for ecosystem services

PES are based on a voluntary transaction where a buyer purchases a defined ecosystem service from a provider, contingent on the provider ensuring the provision of the service (Fripp, 2014). PES schemes can develop due to stakeholders recognizing resource depletion or specific aims related to managing or protecting resources. Common PES drivers involve carbon sequestration, biodiversity protection and the protection of watersheds. PES initiatives can offer ecological and socioeconomic advantages by aligning financial incentives with environmental conservation efforts. These benefits can reach local communities, providing opportunities for sustainable livelihoods (Salzman and others, 2018).

The Costa Rican PES scheme is one of the earliest and most well-known examples of forest protection measures implemented in a developing country. The programme, introduced in the 1996 Forestry Law, incentivizes private landowners to engage in forest protection, reforestation and sustainable forest management, by offering financial incentives funded by the government and international donors[4]. The PES programme aims to conserve and regenerate the country's rainforest, which was rapidly declining until the 1980s, threatening water supply, biodiversity and carbon absorption capacity. A key indicator of the programme's impact is the area of forest surface protected or reforested, with nearly one million hectares covered by the PES scheme at one point, contributing to a significant improvement in forest cover. Through PES, Costa Rica has made substantial progress in promoting environmental sustainability, supporting landowners' incomes, and reducing poverty for small landowners from vulnerable groups[5].

Another successful example is Uganda's Kibale PES scheme. It is one of Africa's earliest and most successful examples of PES initiatives, implemented in the early 1990s in the Kibale National Park to conserve the forest ecosystem while incentivizing local communities to engage in sustainable practices (Osewe and others, 2023). The scheme operated through a partnership between local communities, conservation organizations and the government. Financial compensation was provided to communities based on the provision of ecosystem services, such as carbon sequestration, water conservation and biodiversity protection. The scheme actively involved local communities in decision-making and benefit-sharing, fostering a sense of ownership and responsibility. Revenue was generated from international donors, non-governmental organizations and government funds. The money was used for direct payments to communities or to support community-led projects promoting conservation and sustainable land-use. One notable aspect of the Kibale PES scheme was its success in creating alternative livelihood opportunities for the local communities (Osewe and others, 2023). The scheme helped reduce the communities' dependence on activities threatening the forest ecosystem by providing financial incentives and technical support for sustainable agricultural practices and eco-tourism ventures.

A further example comes from Kenya’s Lake Naivasha PES scheme, implemented to address environmental degradation and water quality issues in this river basin. The PES scheme aimed to incentivize landowners and farmers in the basin to adopt sustainable land management practices, preserving ecosystem services like water quality and biodiversity (Osewe and others, 2023). It operated through a collaboration between the government, conservation organizations and private sector stakeholders. An innovative aspect of the scheme was a system that allowed farmers to redeem vouchers for certified seeds at selected agro-input supplier shops (Osewe and others, 2023). This system offered tangible benefits, encouraging farmers to adopt sustainable practices and enhance productivity. By providing certified seeds, the PES scheme promoted sustainable

[4] Hinojosa (n.d.)
[5] Ibid.

agricultural practices while reducing harmful agrochemical usage that could harm the lake's water quality (Osewe and others, 2023). This incentivized farmers to join the PES scheme. The programme included monitoring and verification mechanisms to ensure the effectiveness of sustainable land management practices in achieving conservation goals. It also provided training and capacity-building support to farmers, enhancing their understanding of sustainable farming techniques and ecosystem conservation.

Despite the benefits they offer, PES schemes also face a number of challenges. Regarding existing evidence reviews on PES, Blundo-Canto and others (2018) found more positive than negative impacts on livelihoods, especially financial benefits. The same systematic review also found trade-offs between different livelihood activities and limited evidence of social impacts.

Liu and Kontoleon (2018) explored the effects of PES on the livelihoods of environmental service suppliers in developing countries. The meta-analysis suggests that PES programmes are likely to have a modestly favourable livelihood influence on service suppliers. The meta-analysis also found that several PES institutional characteristics, including large payments, a high level of voluntary involvement, low transaction costs, and improved access to alternative revenue sources, are associated with more favourable livelihood impacts. Findings from the meta-analysis emphasize the significance of accounting for unobservable confounders when evaluating the effects of PES (which validates the approach taken in this evidence review to look only at evidence from existing SRs). The authors recommend that PES design, implementation and evaluation consider these factors.

Snilsveit and others (2019) covering 18 programmes from 12 countries in Latin America and the Caribbean, East Asia and Pacific, South Asia and sub-Saharan Africa examined the effects of PES programmes on environmental and socioeconomic outcomes. The systematic review highlighted the importance of PES in providing economic incentives to reduce the environmental impacts of land-use. The review found that PES may boost household income, reduce deforestation and improve forest cover. However, as the results are based on a small amount of poor-quality data from a few programmes, they should be interpreted cautiously. Qualitative evidence revealed that (i) a number of factors determine if PES programmes are likely to be effective in various contexts, and (ii) the adoption of robust governance mechanisms and the effective targeting of both locations and participants could enhance intervention effectiveness. Regarding climate mitigation, the systematic review concluded that PES "remains high-risk strategy for climate change mitigation until rigorous impact evaluations can determine its effects."[6]

A more recent review by Jones and others (2020) found that secure land tenure, clear property rights, and effective governance mechanisms are critical in encouraging participation in PES programmes. Additionally, economic incentives and payment levels play a significant role in motivating engagement, while non-monetary benefits like social capital and community relationships also influence participation. Furthermore, transparent and inclusive decision-making processes are essential for fostering participation and ensuring legitimacy. It is also important to note that women and marginalized communities may face barriers to participation, which need to be addressed to ensure equity in PES programmes (Jones and others, 2020).

Samii and others (2015) looked specifically at the effect of PES on deforestation and poverty outcomes and how institutional and social conditions might influence those effects. The review found a weak evidence base, with no studies investigating forest conservation and welfare effects simultaneously. Overall, the effectiveness of PES in reducing deforestation was limited. Further, depending on the context, barriers at the institutional level may have played a significant role.

[6] Snilsveit and others (2019) argued that significant conclusions about the effects of PES cannot yet be drawn based on the current research, however project outcomes might be enhanced by effective targeting and the incorporation of vigorous governance systems.

Overall, the design of PES programmes can be customized to fit the unique characteristics of the ecosystem and the requirements of local stakeholders. Identifying and engaging all relevant stakeholders during the design phase is necessary to secure their support and ensure the fair distribution of advantages (Adhikari and Boag, 2013). Therefore, effective communication and awareness-raising efforts are crucial for encouraging participation and building stakeholder trust, such as through effective community forestry (Persson and Prowse, 2017; Piabuo and others, 2023).

b. Willingness to pay

The concept of willingness to pay (WTP) refers to the amount of money individuals or communities are willing to spend for a specific good or service (Streimikiene and others, 2019). Factors that can influence people's WTP (including for climate mitigation) include income levels, awareness of the good or service, education, geographical location, gender and individual values and attitudes. According to Streimikiene and others (2019), WTP values can vary significantly across regions and economic sectors due to differences in socioeconomic characteristics and environmental concerns.

Obeng, Aguilar and McCann (2018) explored beneficiaries' WTP for forest ecosystem services in the context of payments for PES programmes. The authors highlighted the importance of understanding the factors that influence beneficiaries' WTP, as it is crucial for designing effective PES schemes. Socioeconomic factors such as income level, education, and awareness of the value of forests influence beneficiaries' perceptions of the benefits they receive from ecosystem services and, consequently, their WTP. The paper emphasizes the significance of existence values - the values that people place on the presence of an ecosystem service - such as biodiversity and ecological stability, in shaping beneficiaries' WTP for forest ecosystem services.

However, existence values are often neglected in certain programmes (including PES schemes), leading to an incomplete assessment of beneficiaries' WTP. The study also examines ‘free riding’ where some beneficiaries do not contribute financially to conservation efforts, affecting overall WTP and the sustainability of programmes. To address the free-rider problem and enhance WTP, the authors suggest considering incentive-based strategies or cost-sharing arrangements. Involving local communities in decision-making processes and raising public awareness about the importance of forest ecosystem services can positively impact beneficiaries' WTP.

Sakketa and Prowse (2018) identify the factors contributing to households’ WTP for improving and protecting a multiple-use water scheme in Ethiopia. These schemes do not separate productive and domestic water uses to improve efficiency, equity and durability. Sakketa and Prowse report that the gender of the household head, prevalence of waterborne disease in the household, the time to collect water, contact with extension services, access to credit, level of income and location were all significant factors. The authors highlight how gendered social norms influence women’s access to extension, credit and local markets and how these need to be considered when designing such schemes.

Turning to existing SRs, Null and others (2012) studied the determinants of WTP for cleaner water and found that household income, beliefs and knowledge of the benefits and costs of using the product were significant factors. The same SR found that female participation and financial support during the development of local management capabilities could also affect WTP. Overall, the WTP for improved water quality was low[7].

[7] Null and others (2012) suggested several areas of future research. First, future studies are required to produce service delivery concepts and technical advancements that encourage adoption despite low private valuation. Second, future research that is based on actual purchases will be most beneficial in terms of better understanding valuation and approaches to influence take-up. Third, future evaluations should use randomized prices, actual purchase decisions as

Adebayo and others (2015) focused on WTP for health care. This revealed that the WTP was often determined by income, membership in health associations, high levels of illness and the use modern medicine. Furthermore, the perception of the quality of health care, trust, knowledge, institutional rigidities in payment modality and timing of enrolment campaigns, and cultural beliefs were important predictors of enrolment. Qualitative assessments also highlighted the attitude of health-care workers, patient waiting times and treatment effectiveness as factors contributing to enrolment.

A systematic review by Olum and others (2019) on farmers' adoption of agricultural innovations examined a range of new technologies, practices, and products, and assessed farmers' WTP. The review identified income level, education, access to credit, and perceived benefits of the innovations as key factors influencing farmers' WTP. The study found that farmers' WTP is influenced not only by the economic aspects of the innovations but also by social and environmental factors. It underscores the importance of considering the context and characteristics of each innovation when assessing farmers' WTP.

The paper also identifies methodological differences in WTP studies, such as valuation techniques and survey designs, which can impact the results. The authors highlighted that farmers' WTP is often context-specific and varies across regions and types of innovations. Furthermore, the authors discuss the implications of WTP findings for policymakers, suggesting that understanding farmers' preferences is crucial for the successful adoption and diffusion of agricultural innovations.[8] The systematic review concludes with recommendations for future research, emphasizing the need for standardized methodologies and deeper insights into the underlying drivers of farmers' WTP for agricultural innovations.

To estimate WTP, contingent valuation, choice experiments and hedonic pricing are often-used methods. The contingent valuation method (CVM) is widely used to estimate economic values for ecosystem and environmental services, including use and non-use values. It involves directly surveying individuals to determine how much they would be willing to pay for specific environmental services or how much compensation they would accept to give up these services, contingent on a hypothetical scenario (King and Mazzotta, 2000). Despite its popularity, CVM is also the most controversial among non-market valuation methods.[9]

On the other hand, the main objective of a choice experiment is to estimate the economic values for the various attributes of an environmental good or service, including its price, through a multidimensional, preference-based valuation surface that can be utilized in benefit-cost analysis and other non-market valuation applications (Holmes, Adamawicz and Carlsson, 2017). Moreover, the hedonic pricing method is used to calculate economic values for ecosystem or environmental services that can directly impact market prices.

Understanding WTP is vital for informing policymakers about the potential support for climate adaptation and mitigation policies and allocating resources to address environmental challenges

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opposed to hypothetical contingent value scenarios, and objective usage metrics as opposed to user reports. Fourth, while the focus of this review has been on the impact of pricing in influencing demand for cleaner water, more research is required to fully comprehend the functions of the other three "P"s in the social marketing approach: product (attributes), place (distribution), and promotion. Finally, future studies on willingness to pay should be based on real purchases and use.

[8] See Booth and others (2022) for a recent overview of behavioural science interventions in developing countries.

[9] Randall, Hoehn and Brookshire (1983) define this as “asking individuals, in survey or experimental settings, to reveal their personal valuations of increments (or decrements) in unpriced goods by using contingent markets” (p. 637). In this respect, values collected for a good/service are dependent on the nature of the artificial market alongside the description of the good or service. Yet many respondents are not familiar with placing monetary values on environmental goods/services and may not have a clear foundation for stating their true preference (this is called hypothetical bias in the literature). CVM also features four further forms of bias: free riding and strategic behaviour bias; starting point bias (also know an anchoring); instrument bias (in other words, the mode of payment); and information bias (when the respondent interprets the questions in a different manner from that intended by the enumerator).

effectively. It helps with allocating resources and designing effective strategies to address environmental challenges (Streimikiene and others, 2019).

c. Index-based insurance

The increasing weather-related risks in agriculture due to climate change emphasize the need to offer insurance products, particularly in developing countries where smallholder farmers are particularly susceptible to climate risks (Li, 2022). Index insurance is an innovative financial tool that provides affordable protection for smallholder farmers against crop losses due to drought, thus protecting their livelihoods after suboptimal growing seasons (Steinmetz, n.d.). Unlike traditional indemnity-based insurance, which can be costly for small-scale farmers, index insurance uses data from satellites or weather stations to determine payouts based on specific indices. As a result, the assessment process is less costly, and compensation is paid sooner than traditional insurance (*Appui au développement autonome*, 2022).

When responsibly implemented, index-based insurance can significantly benefit farmers, including reducing their reliance on foreign aid during disasters, preserving their assets and avoiding food shortages. It also encourages on-farm productive investment in good years and improves access to finance for low-collateral or previously deemed "high-risk" borrowers (Steinmetz, n.d.). However, responsible implementation is crucial to avoid negative consequences and ensure long-term sustainable growth in the market for index insurance. Understanding the system's interconnected elements is essential for successful development and farmer acceptance of index-based insurance. These elements include the government, the private sector, local insurance companies, international reinsurers, banks, and agricultural value chains (International Labour Organization, 2017).

Carter and others (2014) conducted a comprehensive review of index-based weather insurance (IBWI) in developing countries, focusing on its effectiveness, scaling-up potential, and impact on farmers' welfare. The evidence suggests that IBWI can play a crucial role in enhancing farmers' resilience to climate variability and extreme weather events. By providing financial protection against adverse weather conditions, IBWI can help farmers stabilize incomes and consumption levels, particularly in regions prone to weather-related shocks. However, several challenges hinder the widespread adoption and scalability of IBWI programmes. One significant challenge is "basis risk," which refers to the potential mismatch between the index used for insurance pay-outs and the actual weather conditions experienced by farmers (Carter and others, 2014). This can lead to situations where farmers suffer losses despite unfavourable weather events. Binswanger-Mkhize (2012) also agrees that basis risk is one of the major challenges of index-based insurance.

Furthermore, the lack of reliable weather data and farmers' limited understanding of insurance mechanisms hinder effective implementation. The paper, therefore, emphasizes that IBWI should be part of a broader risk management strategy complemented by improved agricultural practices, infrastructure development and social safety nets. Tailored indices and an effective regulatory framework are crucial for successful programmes. According to Carter and others (2014), another challenge is the affordability of insurance premiums for small-scale farmers, who often face financial constraints. Additionally, limited access to information and insurance products and inadequate institutional support pose barriers to the uptake and scaling of IBWI in many regions[10].

[10] To address these challenges and promote the up-scaling of IBWI, the authors propose a set of key propositions, that include: i) using twin-track institutional-level index insurance contracts combined with intra- institution distribution of pay-outs to reduce basis risk and improving the quality of insurance; ii) reducing basis risk through multiple technological, contractual, and institutional innovations; iii) using risk layering, combining the use of insurance, credit, savings, and risk-reducing investments to optimally address different categories of risk; and iv) state intervention on the implementation of public certification standards for maximum basis risk of insurance contracts and "smart" subsidies for learning, data accumulation, initial re-insurance, and catastrophic risks.

Access to insurance can significantly impact developing economies, particularly for the poorest populations most affected by catastrophic property damage. In Mongolia, livestock insurance was introduced to reduce risks for capital investments in livestock, especially in the face of severe winter storms called *dzuds* (NDC Partnership, 2013). Index-based livestock insurance was implemented as a sustainable solution, distributing pay-outs based on established index values rather than individual losses, making it more cost-effective for insurers and affordable for herders. The success of index-based livestock insurance in Mongolia was attributed to factors such as providing government data to insurers, educating herders on insurance terms, ensuring affordability and establishing well-governed implementation. Government support for such schemes can also encourage responsible farming practices and societal benefits, leading to long-term economic growth and cost reductions (NDC Partnership, 2013).

In Bangladesh, the Weather Index-based Crop Insurance project was conducted by Shadharan Bima Corporation from March 2014 to June 2018, funded by organizations including the Asian Development Bank and the Japan Fund for Poverty Reduction. The project aimed to pilot weather index-based crop insurance as an innovative risk-adaptation tool for all types of Bangladeshi farmers, especially small farm households, while enhancing financial resilience against emergencies and improving food security (Li, 2022). The evaluation report highlighted the successful installation of 20 automatic weather stations in vulnerable districts and noted that this form of insurance was sold through direct channels, non-governmental organizations and microfinance institutions. Intensive training sessions were held for employees, enrolling 9,641 farm households and increasing awareness about climate and disaster risks among 16,426 farmers (Li, 2022).

Cole and others (2012) focused on the effectiveness of weather insurance and yield-based crop insurance in helping smallholders manage weather-related risk in developing countries. The SR used evidence from Africa and Asia and offered two important conclusions. First, the analysis reveals that several non-price factors, such as financial literacy, trust and liquidity, seem to influence consumer demand for index-based microinsurance products. Second, there is also some, albeit conflicting, evidence that having access to index-based insurance leads to greater use of agricultural inputs like fertilizer. Based on the review's results, the authors suggested piloting group-based microinsurance programmes to ease informational and financial barriers to increase adoption. Furthermore, the authors suggested that the adoption and impact of products are likely to increase if agricultural extension programmes and financial literacy training are combined with the roll-out of insurance products. Overall, the systematic review found that the adoption of index-based products had risen very slowly and found significant evidence gaps in the literature on the effectiveness of index-based insurance[11].

In a more recent review of SRs, Marr and others (2016) did not find an existing rigorous systematic review or meta-analysis of insurance products, despite a substantial underlying evidence base. While meta-analyses exist, insurance products were either too recent to evaluate or were deemed as low quality during the appraisal of studies. They highlight the importance of a high-quality, up-to-date systematic review or meta-analysis on this topic.

d. Results-based payments

Results-based payments (RBP) are a financial instrument that pays for achieved results, encouraging the accomplishment of pre-agreed milestones (Organisation for Economic Co-operation and Development, 2014). Payments are disbursed upon achieving agreed-upon targets and typically after

[11] The authors suggested further research could focus on: (i) the impacts of index-based insurance on economics and agricultural outcomes; (ii) how access to insurance affects agricultural investment choices; and (iii) the impact on different aspects of household well-being on index-based micro-insurance.

verifying that outcomes are authentic and additional – meaning they would not have happened without the project's intervention (World Bank, 2022). RBPs can incentivize the improvement of domestic institutions, policies and infrastructure while involving local communities, the private sector and other stakeholders. By providing an additional revenue stream, RBPs can complement traditional climate finance and can stimulate private sector investment (World Bank, 2022). Given that it is tied to achieving predetermined outcomes, this financing modality can increase the likelihood of project success (Organisation for Economic Co-operation and Development, 2014).

The IEU recently completed a global evidence review on results-based payments across multiple sectors and regional patterns of RBP modalities up to 2020. While the review found evidence in North America, East Asia and Pacific, sub-Saharan Africa, and Latin America and the Caribbean – it found limited evidence in the Middle East and North Africa. Furthermore, almost half of all available evidence was from the health sector, followed by agriculture and forestry, and education. RBP evidence related to the energy sector was limited (Alldredge and others, 2020).

According to World Bank (2022), a key area for RBP financing are nature-based solutions that focus on ecosystems, biodiversity and sustainable management, conservation and restoration of ecosystems. O'Rourke and Finn (2020) explored the role of RBPs in incentivizing farmers to integrate biodiversity conservation and sustainable agricultural practices on farmlands to enhance ecological outcomes. These RBPs involved rewarding farmers based on the actual outcomes of their conservation actions, such as improved biodiversity, habitat restoration and ecosystem services. While the modality was cost-effective, targeted conservation outcomes and was flexible in accommodating diverse farm types, O'Rourke and Finn (2020) found that defining measurable outcomes, addressing additionality and ensuring long-term funding are key challenges related to result-based payments.

In addition to nature-based solutions, sustainable infrastructure within energy, water, transport and urban development provides a further opportunity for RBPs. For example, the World Bank's Carbon Initiative for Development (Ci-Dev) offers results-based climate funding for initiatives that promote off-grid solar markets and improve energy access in low-income nations. Ci-Dev has backed programmes that facilitated the installation of approximately 84,000 solar home systems in households in Kenya and the distribution of more than 700,000 solar lanterns in Ethiopia (World Bank, 2022; Carbon Initiative for Development, 2020). RBP approaches can enhance the technical capacity of developing countries to participate in international carbon markets[12]. The country responsible for generating these emission reductions may be able to count offsets towards their national climate target, as reported in their NDCs (United Nations Framework Convention on Climate Change, n.d).

Independent verification is a crucial aspect of the RBP process, as it ensures the credibility and integrity of the emission reduction claims. For example, the World Bank's Ci-Dev uses a rigorous process involving monitoring, reporting and verification mechanisms to verify emission reductions. Carbon Initiative for Development (2020) follows this procedure to ensure that the emission reductions claimed by the projects it supports are genuine and meet the criteria for results-based climate finance. However, there is a debate within the evaluation literature regarding approaches to measuring RBP project outcomes. For example, Hevenstone and others (2023) examined five European social impact bonds, which all used an RBP financial instrument. Despite evaluators pressing for impact estimates based on experimental or quasi-experimental evidence – the gold-standard approach for measuring impact – in all cases, other approaches were used due to beliefs about public service reform, incentives and the challenges of causal designs.

[12] RBPs can generate income streams that encourage private sector investments and innovations, potentially improving access to private finance and reducing the risks associated with engaging in climate projects (World Bank, 2022).

3. OBJECTIVES

The objective of this evidence review is to collate a comprehensive evidence base to synthesise and address the two research questions framing the assignment:

- To what extent have the selected market-based approaches relevant to mitigation and adaptation effectively achieved desired outcomes in developing countries?
- What factors influence the effectiveness and efficiency of these market-based approaches in developing countries?

The evidence review will be carried out through a synthesis that details a comprehensive and rigorously collated assessment of evidence previously presented in SRs. It will be relevant to the GCF's policies and practices, based on an appraisal of the quality of evidence. Further, the review will use clearly defined criteria, following key protocols applied by leading global institutions in the field of evidence synthesis.

The synthesis aims explicitly to highlight the commonalities across the four market-based approaches and to inform learning within GCF by gathering evidence of shared attributes between the approaches. Furthermore, the review will conduct an in-depth qualitative analysis of the studies currently published in SRs.

The review team will critically appraise the evidence collated through a careful examination of the quality of each systematic review, including an evaluation of the methods used, potential bias and strengths and weaknesses. The review will consider all outcome areas relevant to climate mitigation and adaptation.

B. METHODS

1. THE OVERALL EVIDENCE REVIEW DESIGN APPROACH

This review will aggregate existing evidence within SRs regarding the four market-based approaches. Previous synthesis projects within the environmental sector demonstrate that a successful evidence review (i) embeds stakeholder engagement in the scope of the overall project and synthesis outputs, (ii) uses a rigorous and transparent synthesis approach, (iii) casts a wide initial search to capture a sufficient evidence base for subsequent synthesis, and (iv) integrates the knowledge management aspect of the evidence review with online visualization. Examples of this approach are found in studies on ecosystem services for poverty alleviation (Erasmus, Tannous and Langer, 2017), payments for ecosystem services." (Snilstveit and others, 2018) and gender (Langer and others, 2017). These factors will be woven throughout the review to ensure rigour and replicability.

The specific methods used to produce the evidence review are presented below. The ToC will guide the evidence review, including the importance of barriers and assumptions. This ToC will explore the interlinkages and logical flow of the development and uptake of market-based approaches. It will guide the literature examination within previous SRs, define key questions, and direct specific literature searches by aligning the overall theoretical framework and identifying key words and search terms. Assumptions will identify critical avenues for investigation.

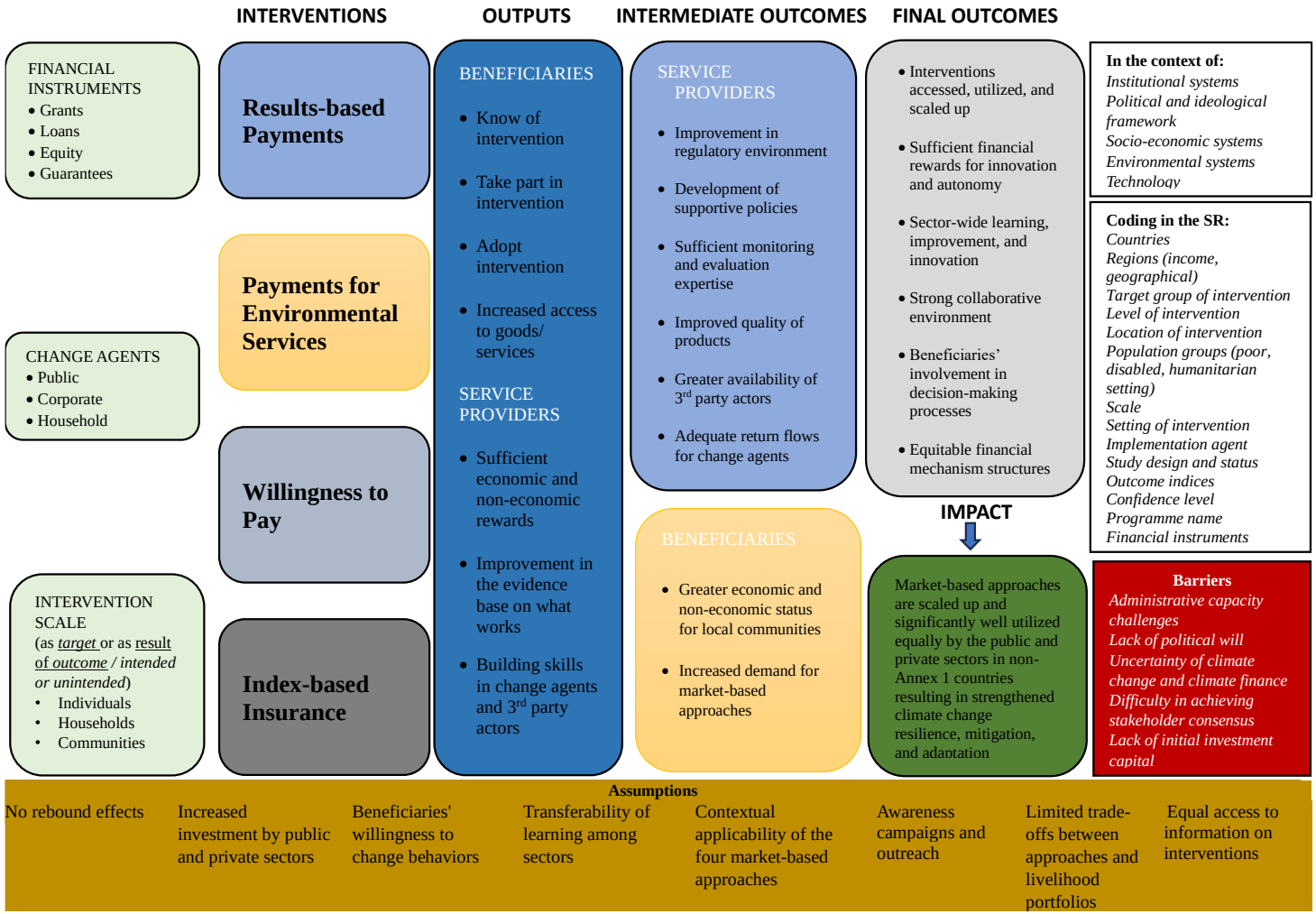
The PICO (Population, Interventions, Comparison, Outcomes) model is used to develop the search strategy, including search terms used to screen repositories and databases. The PICO model is also used to develop the inclusion/exclusion criteria for the documents found through the search process. This section sets out the approach for each of these methods.

2. THEORY OF CHANGE

A ToC is best understood as an iterative and 'live' diagram explaining how a desired change, or impact, is expected to happen.[13] The ToC describes the pathways by which market-based approaches to climate change mitigation and adaptation can be implemented and scaled up by the public and private sectors equally in non-Annex I countries (as defined by the Kyoto Protocol). It defines the overall desired change and explores how long and short-term outcomes create pathways to this desired change as well as activities that contribute to these outcomes, the assumptions made about the pathways of change, and the barriers to making change happen. Key assumptions and activities outlined in this ToC apply to all four market-based approaches and are shown in Figure 1.

[13] The ToC proposed for this assignment will utilize the same definition as provided by the GCF to align understanding of terminologies, as follows: The TOC outlines the rationale for a project/programme, including the pathways and strategies through which the project/programme will tackle the problem. It should identify the long-term project/programme goals and objectives, then map them backwards to identify the necessary preconditions for meeting those goals, the project/programme outcomes and outputs, the activities required to deliver outputs and realize outcomes, and finally the assumptions under which the TOC was developed. In this way, the TOC should communicate how the project/programme's results chain links project/programme activities to the overarching outcomes and impact.

Figure 1. Theory of change relating to the four market-based approaches



Source: Evidence review team

3. INCLUSION/EXCLUSION CRITERIA

The PICO model will be used to clarify and refine the research focus and narrow the scope of the literature search. Keywords and search terms are outlined in Table 1 below.

This review will only include academic papers and published grey literature within existing SRs. Unless translations from other languages are available, these will be written in English and from a time frame between 2010 and August 2023 to exclude studies undertaken in contexts that have since changed considerably.

The review will not include publications that do not directly address the four market-based approaches. It is anticipated that most of the articles and papers from SRs included in the analysis will be peer-reviewed. However, relevant non-published grey literature that may not have been peer-reviewed will also be included.

Population

Inclusion criteria: The review will only include existing publications within SRs on interventions rolled out in developing countries defined as non-Annex I countries in the Kyoto Protocol. It will include studies conducted at several units of observation, including individuals, households, communities and firms and only include studies that specifically address the four suggested market-based approaches. Particular attention will be paid to the impact of market-based approaches on vulnerable populations, gender and indigenous people.

Intervention

The review will assess the extent to which the selected market-based approaches have effectively achieved desired outcomes identified in the ToC. The review will focus only on studies within SRs of studies that evaluate the causal effect of the selected market-based approaches.

Comparison

The review will include studies from existing SRs that have a clearly defined comparison group for evaluation of the treatment effect. As such, the evidence review will summarize the findings of experimental and quasi-experimental designs. In addition, the evidence review will include qualitative assessments of the evidence base.

Outcomes

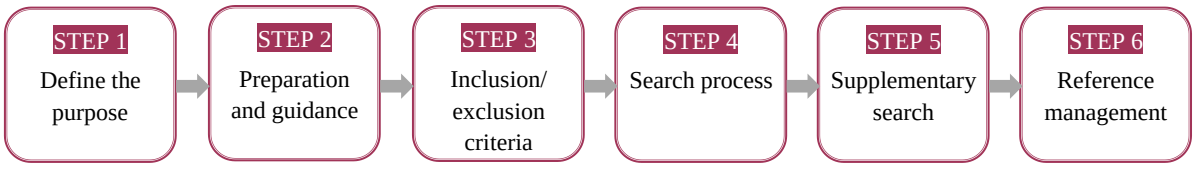
The review will determine and refine outcome measures relevant to mitigation and adaptation, following the broad outcome and impacts defined in the ToC. Outcome measures will not form part of the criteria for including SRs or the papers therein within the review.

C. SEARCH STUDY

1. SEARCH STEPS

Figure 2 illustrates the evidence review's search steps.

Figure 2. Search steps diagram



Source: Evidence review team

Step 1. Define the purpose of the search: The purpose of searching the evidence for relevant SRs is based on understanding the effectiveness of the four market-based approaches regarding mitigation and adaptation and identifying the factors that influence the effectiveness and efficiency of market-based approaches in non-Annex I countries.

Step 2. Preparation and guidance: Two actions support the preparation of the literature search. The first is to conduct a rapid search to check for ongoing reviews. The second is to estimate the number of publications produced in the context of the research questions. These guide the search.

Step 3. Inclusion/exclusion criteria: As demonstrated in the previous section, the PICO model establishes the evidence review's inclusion and exclusion criteria that structure the design of the search strategy. It provides the process to arrive at the search terms, synonyms, index terms and combined search terms for scanning publications.

Step 4. Search process: The bibliographic databases identified by the review team will be used as a starting point for the search, followed by other databases that present the best available evidence. Any use of limits in the search process will be justified.

Step 5. Supplementary search: To add value to the search process by extending the review beyond bibliographic databases, the team will also search grey literature sources with the terms defined to respond to the review's research questions.

Step 6. Reference management: All literature sources used and included in the synthetic review will be managed using Zotero, a reference management software application. This will allow the review to benefit from synchronized formatted citations and issue a collaborative and shareable citation library.

2. DATABASES AND REPOSITORIES

Table 1 lists the databases and repositories the consulting review team selected for the search. Additional sources will likely be identified and added to this list as the team starts to research the relevant topics in greater detail during the next phase of work.

Table 1. List of targeted databases

DATABASE TYPE	NAME OF DATABASE
Academic	Scopus
	Web of Science (Social Science Citation Index, Science Citation Index Expanded, Emerging Sources Citation Index)
	EconLit
	GreenFILE
	3ie International Initiative for Impact Evaluation: https://www.3ieimpact.org/evidence-hub
	PAIS Index
	Panagaea: http://www.pangaea.de/
	Campbell Collaboration: https://www.campbellcollaboration.org/
	GREENR (Global Reference on the Environment, Energy and Natural Resources): https://www.library.tufts.edu/ezproxy/ezproxy.asp?location=greenr
	Environment Complete: http://www.library.tufts.edu/ezproxy/ezproxy.asp?LOCATION=EnvPolInd
	Agricultural and Environmental Science Collection: https://tufts-primo.hosted.exlibrisgroup.com/primo-

DATABASE TYPE	NAME OF DATABASE
	explore/fulldisplay?docid=01TUN_ALMA61160357310003851&context=L&vid=01TUN&search_scope=TUFTS_ALMA&tab=tufts_alma&lang=en_US
	Environment and Energy: https://www.eenews.net/
	EcoAmericas: https://www.ecoamericas.com/
	Bloomberg New Energy Finance: https://researchguides.library.tufts.edu/bloomberg
	JSTOR: https://www.jstor.org/
	Science Direct : https://www.sciencedirect.com/
Grey literature	African Development Bank: https://www.afdb.org/en
	Asian Development Bank: https://www.adb.org/
	Bill & Melinda Gates Foundation: https://www.gatesfoundation.org/
	Building Resilience and Adaptation to Climate Extremes and Disasters: http://www.braced.org
	Collaboration for Environmental Evidence Database of Evidence Reviews: https://environmentalevidence.shinyapps.io/CEEDER/
	Conservation Evidence: https://www.conservationevidence.com/
	Ecologic Institute: https://www.ecologic.eu/
	Earth–Eval: https://www.eartheval.org/
	Collaboration for Environmental Evidence: https://environmentalevidence.org/ceeder-search/
	Global Environmental Facility: https://www.thegef.org/projects-operations/database
	Green Climate Fund: https://www.greenclimate.fund/publications
	Green Finance Platform: https://www.greenfinanceplatform.org/
	Innovations for Poverty Action – Publications: https://www.poverty-action.org/publications
	Inter-American Development Bank – Impact Evaluations Repository: https://www.iadb.org/en/topics-effectiveness-improving-lives/impact-evaluations-repository
	International Drought Resilience Alliance: https://idralliance.global/
	International Fund for Agricultural Development: https://www.ifad.org/en/
	International Initiative for Impact Evaluation: 3ie Development Evidence Portal: https://developmentevidence.3ieimpact.org/
	International Institute for Environment and Development: www.iied.org/
	J-PAL: https://www.povertyactionlab.org/evaluations
	REAL – Resilience, Evaluation, Analysis and Learning: https://www.fsnnetwork.org/REAL
	World Bank: www.worldbank.org/
	United Nations Framework Convention on Climate Change (REDD+): https://unfccc.int/topics/land-use/workstreams/reddplus
	United Nations Framework Convention on Climate Change: https://unfccc.int/
	United Nations Food and Agriculture Organization: https://www.fao.org/home/en
	USAID Development Experience Clearinghouse: https://dec.usaid.gov/dec/content/search.aspx

DATABASE TYPE	NAME OF DATABASE
	World Bank eLibrary: https://elibrary.worldbank.org/

3. SEARCH TERMS

The search strategy includes developing a list of search terms for screening the databases to identify relevant SRs and the evidence therein for inclusion in the systematic review. Search terms are included in Appendix 1.

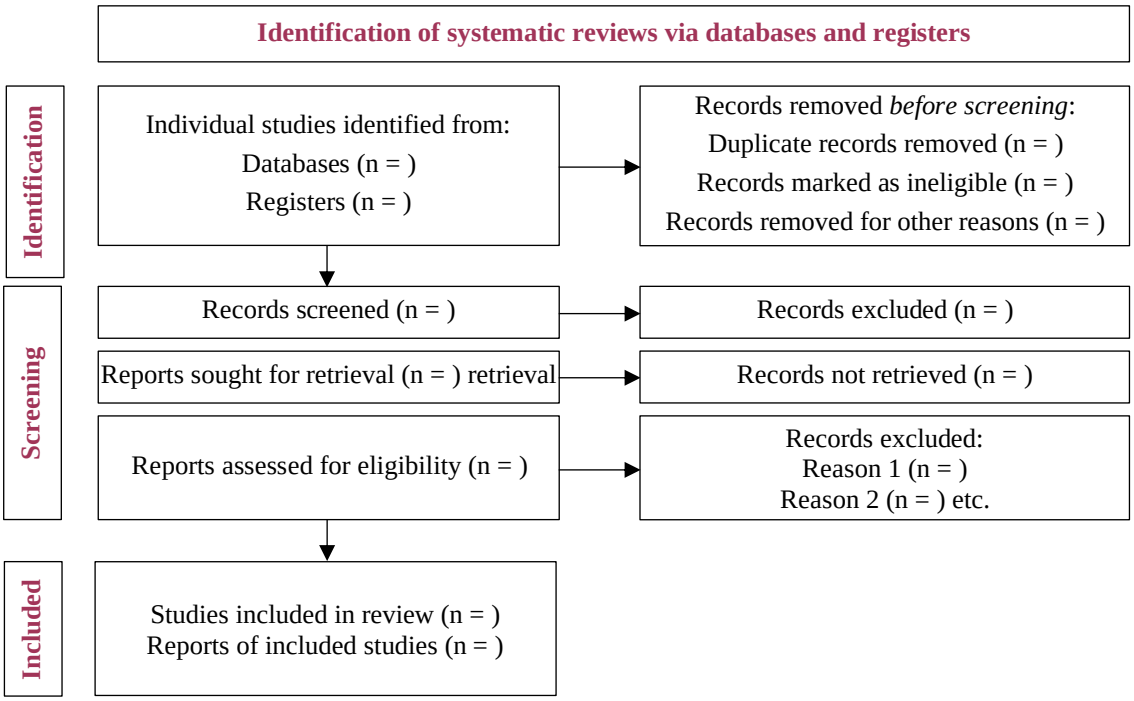
D. DATA COLLECTION AND ANALYSIS

1. SCREENING OF STUDIES FROM WITHIN EXISTING SYSTEMATIC REVIEWS

The broad set of studies highlighted through the search process will be reviewed to determine if they match the inclusion criteria set out for the synthetic review. Only eligible studies will be taken forward to the synthesis stage. Results will be screened in a two-stage process.

The first stage will screen the title and abstract to exclude irrelevant materials. This will be a rapid decision which will be captured and justified in a tracked spreadsheet. If a study progresses to the second stage, it will be examined as a full-text review to assess if it complies with the inclusion criteria. During full-text screening, a justification will be provided for all exclusion and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards outlined in Figure 3.

Figure 3. PRISMA diagram



Source: Adapted from Page and others (2020)

PRISMA standards will be incorporated using the PRISMA 2020 checklist[14] to ensure a robust search and screening process.

2. DATA EXTRACTION AND MANAGEMENT

The evidence review team will use a shared online folder to capture the results from the search process and corresponding studies. The key characteristics of the studies will be gathered in a structured and standardized format. All extracted sources will be stored in a shared and accessible database, and a spreadsheet of the data extracted from each reference will be developed.

The team will use a predefined data extraction tool to obtain data systematically and transparently from the included studies. The coding framework tool highlighted in Box 1 will allow the coding of variables related to:

- Descriptive data, including authors, publication date and status, and other information to characterize the study, including country, type of intervention, outcome, population and context.
- Information on intervention design, including implementation fidelity, how the intervention considers equity, participant uptake and adherence, contextual factors and programme mechanisms.

The team will consider using NVivo as its coding tool for interpreting qualitative data and determining thematic recurrences. Box 1 provides further information about NVivo.

Box 1. NVivo

NVivo analyses unstructured text, audio, video, and image data, including (but not limited to) interviews, focus groups, surveys, social media and journal articles. It is the preferred coding tool as it allows researchers to manage, analyse and visualize qualitative data and documents systematically and individually.

NVivo makes it easier to do the following:

- Organize and analyse text, audio, video or image data.
- Capture social media and website data using its NCapture browser plug-in.
- Import citations from EndNote, Mendeley, Zotero or other bibliographic management software.
- Perform simple text analysis queries (such as text search or word frequencies) for text data.

The coding process using NVivo gathers related material into a container called a “node”. When a node is opened, all the references in the project are coded into it. NVivo has several types of codes. The node structure can be defined first, followed by coding at the existing nodes. Alternatively, new codes can be created at nodes as files are worked through (Kent State University, n.d.).

Coding with NVivo applies an analytical process to categorizing data. By assigning a unique code to the findings that emerge from the systematic review, the coding will support combining complementary themes and theories. These can be brought together from the coded material to synthesize the data and arrive at conclusions that meet the evidence review’s objectives. This approach can support the review’s outcome by adding a robust procedure for deriving commonalities and capturing mechanisms that contribute to the effectiveness and efficiency of the four market-based approaches using existing evidence.

[14] Available at http://prisma-statement.org/documents/PRISMA_2020_checklist.pdf.

3. CRITICAL APPRAISAL

The evidence review team will use a critical appraisal tool to assess the studies taken from existing SRs. The tool will enable authors to critically assess the impact of bias on the trustworthiness of primary impact evaluations. These critical appraisals refer to the review team's confidence that studies used for the synthesis are rigorous and credible (Maclure, Paudyal and Stewart, 2015; Langer and others, 2017).

Two internal reviewers will independently assess each study and compare their decisions. Where the reviewers disagree about the risk of bias rating for a particular study, they will consult with a third reviewer.

4. SYNTHETIC REVIEW

The collected relevant material will be analysed, and findings combined to synthesize the causal evidence and explore the commonalities between the four market-based approaches and the conditions that affect their effectiveness in non-Annex I country contexts.

The final products from the synthesis will inform presentations and/or summaries that support the IEU in the dissemination, outreach and uptake of the review's outputs. These materials will support the IEU's efforts to ensure GCF is an effective institution and committed learning organization for future programming delivering positive change.

E. CONCLUSIONS

The IEU seeks to assess the viability and common attributes of four market-based approaches to encourage private sector investments in developing country contexts towards climate mitigation/adaptation interventions. This approach paper sets out the methodology for a synthetic review that gathers evidence from existing SRs to demonstrate the potential impact and best approaches to four market-based approaches: Payments for environmental services, Willingness to pay, Index-based insurance and Results-based payments.

The GCF is well-placed to carry out this evidence review and the Secretariat can consider how to apply the findings to subsequent programming and investments. By drawing on its strong focus on private sector finance, it can provide the understanding needed to invest in mitigation and adaptation solutions in developing economies.

Two specific challenges might arise in applying the four market-based approaches. Firstly, making the case for private sector funding in market areas dominated by public funding entities in developing countries. And secondly, de-risking the market-based approaches for the private sector. As such, this evidence review will seek to ascertain if sufficient evidence exists to develop a supportive narrative for this specific form of climate finance and the precise applications most likely to yield sustained impact.

Overall, the evidence review is expected to enhance awareness of the potential for GCF programming in these areas, which approaches have proven viable and effective, in which contexts, and what factors mediate this success.

APPENDICES

Appendix 1. SEARCH TERMS

The search terms presented below will be used to screen the available databases and literature sources for SRs.

POPULATION

Africa OR Asia OR Caribbean OR "West Indies" OR "South America" OR "Latin America" OR "Central America" OR Afghanistan OR Albania OR Algeria OR Angola OR Antigua OR Barbuda OR Argentina OR Armenia OR Azerbaijan OR Bahamas OR Bahrain OR Bangladesh OR Barbados OR Benin OR Belize OR Bhutan OR Bolivia OR Bosnia OR Herzegovina OR Hercegovina OR Botswana OR Brasil OR Brazil OR Darussalam OR "Burkina Faso" OR "Burkina Fasso" OR "Upper Volta" OR Burundi OR Urundi OR Cambodia OR "Khmer Republic" OR Kampuchea OR Cameroon OR Cameroons OR Cameron OR Camerons OR "Cabo Verde" OR "Cape Verde" OR "Central African Republic" OR CAR OR Chad OR Chile OR China OR Colombia OR Comoros OR "Comoro Islands" OR Comores OR "Cook Islands" OR Congo OR Zaire OR "Costa Rica" OR "Cote d'Ivoire" OR "Ivory Coast" OR Croatia OR Cuba OR Cyprus OR Czechoslovakia OR "Czech Republic" OR Slovakia OR "Slovak Republic" OR Djibouti OR "French Somaliland" OR Dominica OR "Dominican Republic" OR "East Timor" OR "East Timur" OR "Timor Leste" OR Eswatini OR Ecuador OR Egypt OR "United Arab Republic" OR "El Salvador" OR Eritrea OR Estonia OR Ethiopia OR Fiji OR Gabon OR "Gabonese Republic" OR Gambia OR Georgia OR Ghana OR "Gold Coast" OR Greece OR Grenada OR Guatemala OR Guinea OR Haiti OR Honduras OR India OR Maldives OR Indonesia OR Iran OR Iraq OR Israel OR Jamaica OR Jordan OR Kazakhstan OR Kazakh OR Kenya OR Kiribati OR Korea OR Kosovo OR Kyrgyzstan OR Kirghizia OR "Kyrgyz Republic" OR Kirghiz OR Kirgizstan OR "Lao PDR" OR Laos OR Latvia OR Lebanon OR Lesotho OR Basutoland OR Liberia OR Libya OR Macedonia OR Madagascar OR "Malagasy Republic" OR Malaysia OR Malaya OR Malay OR Maldives OR Malawi OR Nyasaland OR Mali OR Mauritania OR Mauritius OR Mexico OR Micronesia OR "Middle East" OR Moldova OR Moldovia OR Mongolia OR Montenegro OR Morocco OR Mozambique OR Mocambique OR Myanmar OR Myanma OR Burma OR Namibia OR Nauru OR Nepal Nicaragua OR Niger OR Nigeria OR "Northern Mariana Islands" OR Niue OR Oman OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Philipines OR Phillipines OR Phillippines OR "Puerto Rico" OR Romania OR Rumania OR Roumania OR Rwanda OR Ruanda OR "Saint Kitts" OR "St Kitts" OR Nevis OR "Saint Lucia" OR "St Lucia" OR "Saint Vincent" OR "St Vincent" OR Grenadines OR Samoa OR "Samoan Islands" OR "Sao Tome" OR Principe OR "Saudi Arabia" OR Senegal OR Serbia OR Montenegro OR Seychelles OR "Sierra Leone" OR Slovenia OR "Sri Lanka" OR Singapore OR "Solomon Islands" OR Somalia OR Sudan OR Suriname OR Surinam OR Swaziland OR Syria* OR Tajikistan OR Tadzhikistan OR Tadjikistan OR Tadzhik OR Tanzania OR Thailand OR Togo OR "Togolese Republic" OR Tonga OR Trinidad OR Tobago OR Tunisia OR Turkey OR Turkmenistan OR Turkmen OR Tuvalu OR Uganda OR Ukraine OR "United Arab Emirates" OR UAE OR Uruguay OR Uzbekistan OR Uzbek OR Vanuatu OR "New Hebrides" OR Venezuela OR Vietnam OR "Viet Nam" OR "West Bank" OR Yemen OR Zambia OR Zimbabwe OR "developing country" OR "developing countries" OR "developing nation" OR "developing nations" OR "developing world" OR "less-developed countr*" OR "less developed countr*" OR "less-developed world" OR "less-developed world" OR "lesser-developed countr*" OR "lesser developed countr*" OR "lesser-developed nation" OR "lesser developed nation*" OR "lesser developed world" OR "lesser-developed world" OR "under-developed countr*"

OR “under developed countr*” OR “under-developed nation*” OR “under developed nation*” OR “under-developed world” OR “underdeveloped world” OR “under developed world” OR “underdeveloped countr*” OR “under-developed countr*” OR “Under developed countr*” OR “under developed nation*” OR “under-developed nation*” OR “underdeveloped nation*” OR “lower middle income countr*” OR “lower middle-income countr*” OR “lower middle income nation*” OR “lower middle-income nation*” OR “upper middle-income countr*” OR “upper middle income countr*” OR “upper middle-income nation*” OR “upper middle income nation*” OR “low-income countr*” OR “low income countr*” OR “low-income nation*” OR “low income nation*” OR “lower income countr*” OR “lower-income countr*” OR “lower income nation*” OR “lower-income nation*” OR “Low- and Middle- Income countr*” OR “Low and Middle Income Countr*” OR “underserved country” OR “underserved countries” OR “underserved nation” OR “underserved nations” OR “underserved world” OR “under served country” OR “under served countries” OR “under served nation” OR “under served nations” OR “under served world” OR “deprived country” OR “deprived countries” OR “deprived nation” OR “deprived nations” OR “deprived world” OR “poor country” OR “poor countries” OR “poor nation” OR “poor nations” OR “poor world” OR “poorer country” OR “poorer countries” OR “poorer nation” OR “poorer nations” OR “poorer world” OR “developing economy” OR “developing economies” OR “less developed economy” OR “less developed economies” OR “lesser developed economy” OR “lesser developed economies” OR “under developed economy” OR “under developed economies” OR “underdeveloped economy” OR “underdeveloped economies” OR “middle income economy” OR “middle income economies” OR “low income economy” OR “low income economies” OR “lower income economy” OR “lower income economies” OR lmic OR lmics OR “third world” OR “lami country” OR “lami countries” OR “transitional country” OR “transitional countries” OR “LMIC” OR “LMICs” OR “LIC” OR “LICs” OR “UMICs” OR “UMIC” OR (“khmer” AND “republic”) OR (“cape” AND “verde”) OR (“central” AND “african” AND “republic”)

METHODOLOGY

“Systematic review*” AND “Systematic rev*” OR “meta-analy*” OR “meta analy*” OR “metaanaly*” OR “meta-regress*” OR “meta regress*” OR “metaregress*” OR “systematic literature rev*” OR “rapid evidence assessment*” OR “rapid review*” OR “evidence assessment” OR “evidence assess*” OR “scoping review” OR “evidence and gap map” OR “evidence gap map” OR “mixed method review” OR “integrative review” OR “living systematic rev*” OR “review of complex interventions” OR “review of complex int*” OR “review of system*” OR “review of rev*” OR “umbrella review” OR “"research synthesis" OR “rapid evidence assessment*" OR "systematic literature review*" OR "systematic* review*"

INTERVENTIONS

Willingness to pay

“Willingness to pay” OR “willingness-to-pay” OR “WTP” OR “willingness to accept” OR “acceptance to pay” OR “willingness to purchase” OR “willing to pay” OR “willingness to buy” OR “consumer behavior” OR “consumer behaviour” OR “contingent valuation” OR “contingent valuation method” OR “willingness*” OR “choice experiment” OR “discrete choice experiment” OR “price premium” OR “preference*” OR “purchase behavior” OR “purchase behaviour” OR “purchase intention” OR “price acceptance” OR “stated preference*” OR “revealed preference*” OR “discrete choice model” OR “discrete choice conjoint experiment” OR “part-worth" OR “functional measurement” OR “choice experiment”

Results-based payments

"payment* by result*" OR "result*-based payment*" OR "result*-based financ*" OR "result*-based fund*" OR "result*-based aid" OR "pay*-for-result*" OR "pay*-for-performance" OR "pay*-forsuccess" OR "performance-based fund*" OR "performance-based financ*" OR "performance-based aid" OR "performance-based pay*" OR "performance-related pay*" OR "performance-based incentiv*" OR "cash on delivery" OR "performance-based incentive*" OR "output-based aid" OR "outcome-based financ*" OR "incentiv* pay*" OR "merit pay" OR "performance-oriented transfer*" OR "performance-based contracting" OR "performance-driven loan*" OR "policy-based loan*" OR "result*-based lending" OR "grand challenge*" OR "proportional prize" OR "winner-takeall" OR "inducement prize*" OR "impact bond*" OR "social benefit bond*" OR "green bond*" OR "development bond*" OR "payment* for ecosystem* service*" OR "payment* for environment* service*" OR "payment* for ecosystem* benefit*" OR "payment* for environment* benefit*" OR "carbon credit*" OR "carbon offset*" OR "advance* market commitment*" OR "pull mechanism*" OR "pull fund*" OR "pull financ*"

Insurance

“index based insurance” OR “index-based insurance” OR “weather index insurance” OR “weather-index insurance” OR “index-based insurance” OR “index micro-insurance” OR “index* micro insurance” OR “rainfall insurance” OR “yield insurance” OR “livestock insurance” OR “area yield insurance” OR “crop insurance” OR “parametric insurance” OR “rainfall-insurance” OR “yield-insurance” OR “livestock-insurance” OR “area-yield insurance” OR “crop insurance” OR “parametric insurance” OR “parametric index ins*” OR “parametric ins*” “parametric crop*” OR "parametric rainfall*” OR "parametric livestock*” OR “basis risk” OR “index insurance” OR “agricultural insurance” OR “weather derivative” OR “weather insurance” OR "crop-yield insurance" OR "crop-revenue insurance" OR “index-linked insurance”

Payment for ecosystem services

“Payments for Environmental Services” OR “Payment for Environmental Services” OR “Payments for Ecosystem Services” OR “Payment for Ecosystem Services” OR “Rewards for Environmental Services” OR “Reward for Environmental Services” OR “Rewards for Ecosystem Services” OR “Reward for Ecosystem Services” OR “PES” OR "payment* for ecosystem* service*" OR "payment* for environment* service*" OR "payment* for ecosystem* benefit*" OR "payment* for environment* benefit*" OR "carbon credit*" OR "carbon offset*" OR "advance* market commitment*" OR "pull mechanism*" OR "pull fund*" OR "pull financ*"

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