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The Impact of Corruption on Climate Change Mitigation

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Abstract

This is a review of the rapidly growing literature on how corruption affects climate change mitigation, focusing both on greenhouse gas emissions and carbon sinks. Analyzing 200 studies, we document that corruption hampers mitigation, i.e. increases emissions, and worsens sinks' storage capacity through deforestation or overfishing. Reducing corruption is vital to successfully combatting global warming, because corruption makes climate policies less ambitious when formulated and less effective when implemented, due to low rule compliance. The findings are established through various types of data, research designs and methods. Trends are mapped and points of disagreement are highlighted. We suggest that research move beyond using country-level indicators and propose several avenues for future research.

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ABSTRACT
This is a review of the rapidly growing literature on how corruption affects climate change mitigation, focusing both on greenhouse gas emissions and carbon sinks. Analyzing 200 studies, we document that corruption hampers mitigation, i.e. increases emissions, and worsens sinks' storage capacity through deforestation or overfishing. Reducing corruption is vital to successfully combatting global warming, because corruption makes climate policies less ambitious when formulated and less effective when implemented, due to low rule compliance. The findings are established through various types of data, research designs and methods. Trends are mapped and points of disagreement are highlighted. We suggest that research move beyond using country-level indicators and propose several avenues for future research.

In Madagascar, corruption destroys forests which could have absorbed carbon … What happens in Madagascar happens, to various degrees, on the entire planet. Corruption lies at the root of the climate crisis.

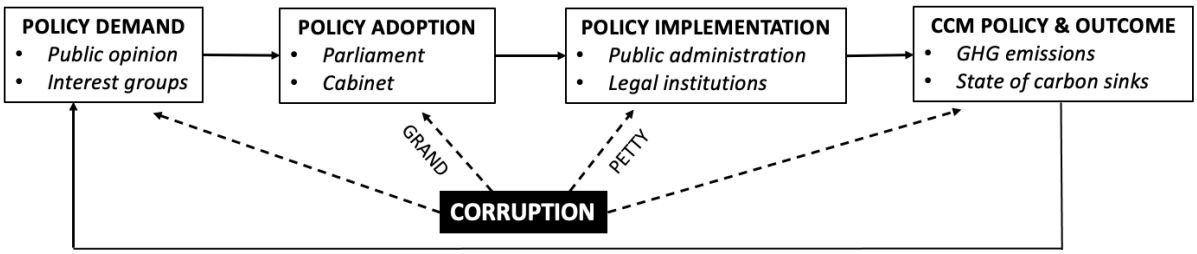
- Ketakandriana Rafitoson, Executive Director of Transparency International Madagascar[1]

1. INTRODUCTION

Many countries fail to meet their Nationally Determined Contributions within the Paris Agreement framework[2,3]. This is highly worrisome because these targets are crucial to limit the global temperature increase. There are several factors contributing to countries' insufficient progress in reducing their emissions and sustaining their carbon sinks, including the dependence of industry on fossil fuels[4], unfavorable public opinion on climate policies adoption[5], and widespread tropical deforestation[6]. Another reason for these failures lies in various dysfunctionalities in countries' political and administrative systems, leading to weak and poorly implemented climate policies. In this review, we specifically focus on *corruption* as an impediment to climate change mitigation (CCM) efforts, as it distorts both decision-making and implementation of CCM policies. There is a large and quickly growing literature on corruption and its impact on CCM. However, the insights from this sizeable research body warrants synthesis in a current and encompassing assessment. Thus, the aim of this study is to review the literature on how corruption has an impact on CCM.

An established definition of corruption is "the abuse of entrusted power for private gain"[7], taking the form of behaviors such as bribery, kickbacks, embezzlement, or nepotism[8]. With regards to CCM efforts, corruption can disturb the policy cycle in the adoption phase, e.g., through large-scale behavior when politicians are bribed not to enact stricter emission standards (grand corruption), or through small-scale behavior in the implementation phase, e.g., when bureaucratic actors such as forest rangers accept money or gifts to turn a blind eye to illegal extraction (petty corruption). Figure 1 presents a stylized policy cycle, illustrating the ways corruption affects climate policies ranging from the decision to the outcome. A key insight is that there is a wide variation in the levels of corruption globally, where some countries' governance is defined by widespread corrupt practices. The maps in Appendix A (Figures A1-A3) visually depict how three standard measures of corruption vary between countries.

Figure 1. ***A stylized model of how corruption affects the climate change mitigation (CCM) policy cycle*****.**



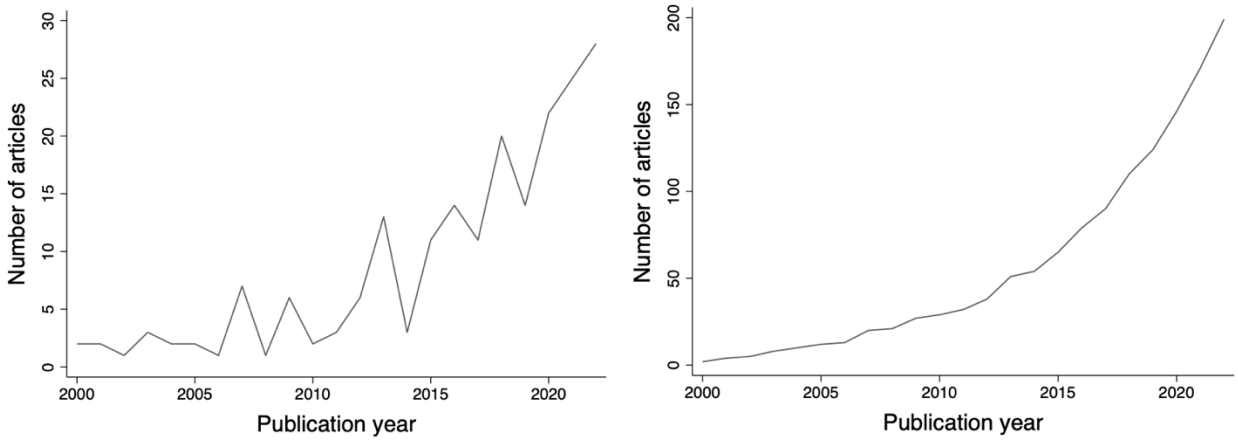
Note: Within the CCM policy cycle, policy demands from citizens or interest groups motivate policy adoption by politicians. These decisions are then implemented and, in turn, eventually generate CCM policies and outcomes. There is also feedback from outcomes to demands for policy. Corruption can affect all these stages.

Defining CCM as "a human intervention to reduce emissions or enhance the sinks of greenhouse gases"[9] invites the study of both (a) emissions of greenhouse gas (GHG) such as carbon dioxide, methane, or nitrous oxide to Earth's atmosphere, and (b) natural carbon sinks, primarily referring to vegetation and the ocean. Moreover, it comprises the study of policies targeting (a) and (b). Most works on how human activities affect natural carbon sinks focus on vegetation (e.g. deforestation) – and, indeed, mainly forestry has been studied in relation to corruption. However, we also include studies on corruption in fisheries due to documented links on how human activities impact biomass in the sea and the ocean's capacity as a sink[10]. We do not focus on carbon capture and storage, because these attempts are at their initial stage and so far there is no discussions on how corruption impacts these processes. Therefore, we both focus on CCM *policies* (e.g., legal and economic policy instruments, such as carbon taxes and bans of fuels) and CCM *outcomes* (e.g., measures of GHG emissions, deforestation, or overfishing). We here acknowledge that different CCM policies can be introduced with different motivations. For instance, a policy to reduce deforestation might be installed for other reasons than to sustain carbon storage but might still have carbon sequestration effects.

There are previous attempts to summarize the literature on corruption and aspects related to CCM[11–16], but these are typically more specialized in scope (e.g., only focus on deforestation) (our Appendix C outline their scope in detail). Moreover, earlier overviews do not fully capture the steep

increase in more recently published works on corruption and CCM. In Figures 1-2, depicting the rapid growth of this literature, we document the particularly big increase in studies on this topic since the year 2015, which coincides with the Paris Agreement being signed (see Appendix B for sub-trends). In total, we analyze 200 studies published in the years 2000-2022.

Figure 2. Articles published per year (left panel) and accumulated numbers (right), on corruption and CCM



Note: The figure reports time trends based on our final sample of 200 articles.

Our review of this literature is guided by the following research questions:

1. How does corruption affect climate change mitigation (CCM)?
2. How is this effect studied and established?

In addition to answering these research questions in our results section, we identify points of disagreement and major knowledge gaps in the discussion section.

2. RESULTS

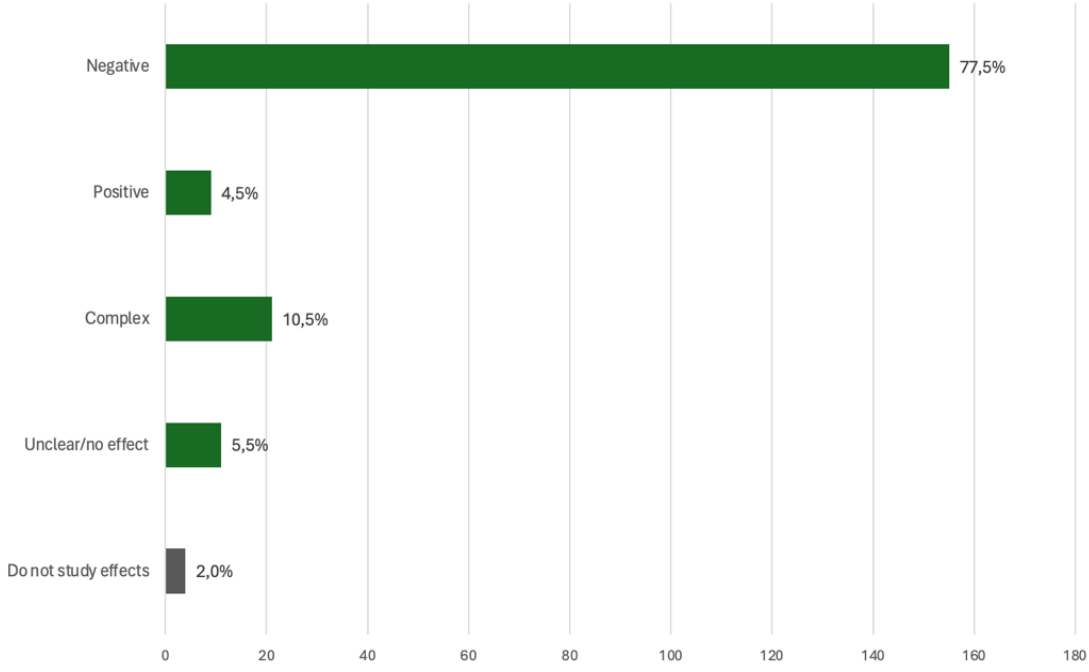
Mainly negative effects from corruption on CCM

The main finding of our analysis is that corruption hampers CCM. Of our sample of 200 articles, 78% find that the association between corruption and CCM is *negative*. That is, a higher level of corruption tends to be linked to more emissions of GHG or processes that indirectly lead to more GHG emissions

and reducing the carbon storage capacity of sinks. We have identified 155 articles that document, for instance, how widespread bribery leads to weakly enforced CCM policies locally – e.g., people are less likely to abide by rules to limit illegal logging[17] or illegal fishing[18], as they can pay officers to evade sanctions – or, on the aggregate, how higher national levels of corruption is associated with observed outcomes such as larger quantities of CO_2 release[19] or more severe rates of deforestation[20,21].

A smaller share of articles, around 11% of the sample, conclude that the relationship is complex, e.g., claiming that the effect of corruption on CCM is conditional on the levels of GDP per capita[22–24], or on countries' colonial origins[25]. Only 5% of studies suggest that there is a positive relationship between corruption and CCM. These studies tend to find an indirect effect, where more corruption has an association with lower economic development, thereby being linked to lower rates of deforestation and lower GHG emissions (e.g., [26,27]).

Figure 3. The direction of the association between corruption and climate change mitigation (CCM) in 200 reviewed studies



Note: The figure describes trends in our sample of 200 studies. The category "do not study effects" consists of non-empirical studies, e.g., reviews or theoretical models.

A variety of approaches documenting negative effects

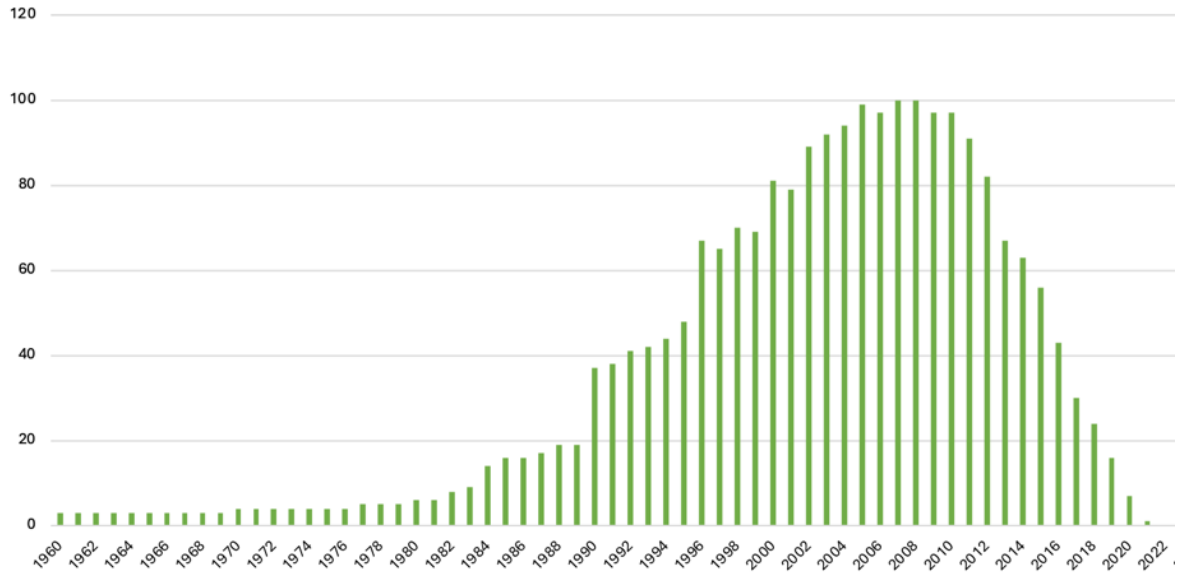
By and large, the reported negative effects are documented through several approaches, including single case studies from different countries, studies with global and regional scope, using different methods, and across various time periods. Overall, this suggests that this trend of a negative association is not driven by any country-specific factor or the use of a particular method.

With regards to the *geographical* scope of the full sample, about 29% have a global coverage, as they study a large proportion of the world's countries dispersed widely and not on a single continent. Another 36% are single-country studies from different parts of the world and 35% are regional studies, focusing on a smaller set of countries, including for example, the OECD, the MENA region, Asia, Latin America or Africa, in different constellations. Hence, there are only a few spatial blind spots. However, when distinguishing the studies related to GHG emissions on the one hand, and on sinks, on the other, we find some differences. In the studies on sinks, mostly focusing on deforestation, the share of articles predominantly study countries in the Global South. While there are very few single-country studies on corruption and deforestation in the Global North, there are numerous in-depth studies on corruption and tropical deforestation (in the Global South), not the least covering South-East Asia (see Figures D.1. and D.2 in the Appendix). We also note that most studies on corruption and sinks (61 studies) focuses on deforestation, whereas only 7 focuses on corruption and fisheries.

The sample has a broad temporal scope, as many studies use panel data, often having country-year as the unit of analysis. When pooling the years studied, including those that only focus on one year, we observe that the period 2000-2012 is especially well-represented (see Figure 4). It should be noted that this does not suggest that there is a decreasing interest on this topic, but rather that there is a temporal lag in existing work. It is likely that the more recent studies do not cover the latest years because of a delay in data availability and the time it takes for studies to undergo peer review. Moreover, the distribution of studied years hints at what we interpret as a product of data availability, as many

country-level indicators typically do not provide estimates of corruption or CCM outcomes before the 1990s.

Figure 4. Number of year-observations covered by the literature on corruption and CCM



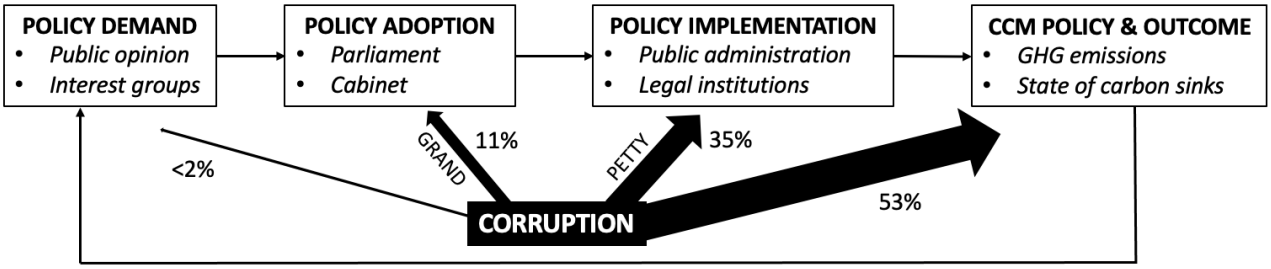
Note: The figure describes trends in the 160 studies with an empirical focus where we could code this information. Studies with a focus on one year enters the sample as one year-observation.

A majority of the studies (76%) in the sample use quantitative methods – that is, large-n studies with statistical tests – rather than qualitative approaches. Importantly, among the quantitative studies in the full sample, a large portion consists of cross-national studies where a smaller set of data sources is used repeatedly. That is, only a few established indicators are used in the majority of studies measuring corruption, deforestation, and GHG emissions (see details in Appendix E).

With regards to the *mechanism* through which corruption affects CCM, the studies are less consistent. Only a minority of articles empirically addresses how corruption impacts a specific part of the policy cycle (not including review articles). To illustrate, 11% of the articles study corruption in the phase of climate policy adoption (using methods that capture corrupt behavior during climate policy adoption) and 36% study corruption in the climate policy implementation phase. In contrast, most of the articles (53%) do not disentangle empirically where corruption disturbs the CCM policy cycle (see

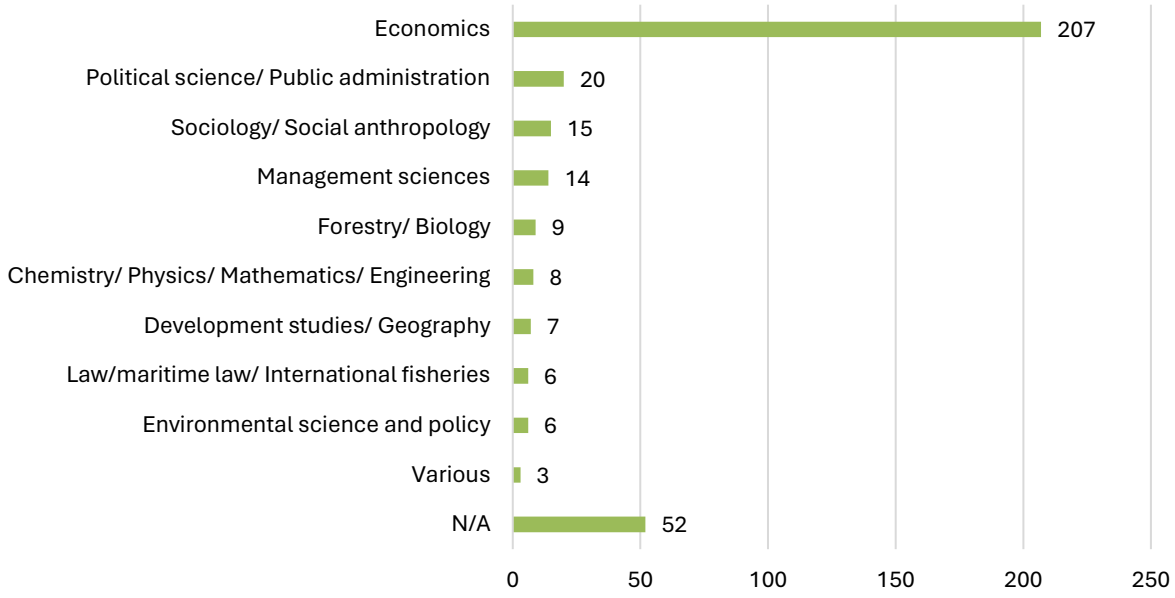
Figure 5). This latter category consists of studies that theorize how corruption affects a specific part of the policy cycle – but do not use a corresponding empirical measure to provide sufficient evidence – or studies that neither specify the mechanisms empirically or theoretically. Related, there is also a tendency to not distinguish between petty and grand forms of corruption. A plausible explanation is methodological as qualitative studies in the sample tend to analyze the mechanisms behind corruption effects, while quantitative studies use indicators that capture an aggregate estimate of corruption phenomena and do not differentiate between these different forms of corruption.

Figure 5. Distribution of studies on corruption and climate change mitigation (CCM) outcome



A final observation is the trend that the literature on corruption and CCM is characterized by a high presence of the economics discipline, both in terms of type of journals and affiliation of researchers. Tracing the present affiliation and degrees of authors in our sample, we find that 207 individuals – out of 347, in total – are affiliated to economics departments, while similar numbers for political scientists are 20, for sociologists 15, and legal scholars 6 (see Figure 6).

Figure 6. Disciplinary affiliation of authors of the reviewed studies



Note: This figure shows the affiliation of all researchers on the author list for the 200 studies in our sample. We searched for affiliation of these people and evaluated how to classify each affiliation. The category "various" includes people at departments that do not fit the larger categories we created. The category "N/A" consists of researchers whose affiliation we could not document.

3. DISCUSSION

Our literature review establishes that corruption impedes CCM, as corruption distorts both CCM policy adoption and implementation, thus making it harder to limit GHG emissions and uphold the absorbing capacity of carbon sinks. However, despite this predominant finding, it can be established that several tensions and omissions remain, each of which should be further investigated in future research.

A large portion of studies has *a macro-level focus*, comparing countries over time and space. This research vein tends to rely on the most established indicators of corruption, which has at least *three* implications for the conclusions to be drawn.

First, the widespread use of corruption indices has consequences for research design and, consequently, possible conclusions from such studies. Given the limitations in making causal inferences from observational data, we would like to stress that associations between corruption measures and CCM-related outcomes – documented through numerous studies – are, in the end, only correlational

evidence. As depicted in Figure 5, most of the studies do not capture any mechanisms empirically. However, we have identified a smaller set of articles that aim to understand mechanisms – and use designs that captures mechanisms empirically – providing inferences on whether and how corruption impacts CCM outcomes. Encouraging such type of studies, we suggest that research would benefit from going beyond the use of aggregate indicators. Linked to this, we would like to point to studies in our sample that demonstrate how corruption distorts the CCM policy cycle in a specific and nuanced way. The branch of studies that examines intricacies of how logging regulations are distorted by bribery (e.g. [17,28,29]) is a good example of scholarship with qualitative interview methods that documents mechanisms of *how* corruption impedes rules to limit deforestation. Similarly, an example of work that uses quantitative methods to document mechanisms is Oliva[30]. The study quantifies the magnitude of how bribery is used to tamper with emissions reporting in automobile repair shops in Mexico City. Both these examples refer to the implementation phase of CCM policies. Related to what type of research we would like to see more of, we have observed very few studies that document *in-depth* insights on how bribery is used to sway decision-makers away from imposing stricter regulations (in the adoption phase of the policy cycle). More work on this topic is welcome, although we acknowledge the obvious challenges with this type of studies, as (mis)behavior of legislators is indeed difficult to capture.

Second, established indices measure corruption within *domestic (national)* institutions. As such, they do not capture if actors in country A are more likely than actors from country B to pay bribes when they conduct affairs abroad. To illustrate, the Bribe Payers Index was a measure of the tendency of a nation's corporations to pay bribes abroad. It was published by Transparency International from 1999 to 2011 but is no longer updated. This measure showed that companies of some countries in the Global North are much more likely than companies from other countries to engage in corruption abroad. We have not seen this measure being used in the literature on CCM and, because it is now dismantled, we envision that such attempts are not likely to occur soon. This hints at a blind spot, as this literature does not investigate if some countries are less capable than others to prevent their companies

from using bribes in CCM-related businesses abroad. This could lead to a possible bias in the conclusion that corruption is driven by the countries in the Global South, while largely underestimating the role of companies from the North engaged in harmful activities, e.g., logging.

Third, a further implication from the high presence of cross-national studies is that they – besides highlighting that corruption is an obstacle – might not help policymakers to find solutions to the problem. We likely need to move towards more specific insights on how to avoid or navigate corruption to understand how to achieve effective CCM efforts in corrupt contexts. This connects to our thoughts on some missing areas in this research field. By its nature, researching corruption is difficult, as the behavior evades public scrutiny. Thus, studying what happens in "smoke-filled back rooms" will continue to be a challenge. One way to move past this impasse could be to pay more attention to periods of reforms directed at anti-corruption and transparency and how the implementation of these reforms impacts CCM. However, current research on corruption and CCM has paid little attention to anti-corruption. Thus, a more outspoken focus on the effects from anti-corruption efforts is an important avenue for future research. The study on third-party auditors in an Indian state by Duflo and colleagues[31] – showing how independent audits that are not corrupted can reduce industrial emissions – is an example of work that points to ways in which anti-corruption efforts can be designed to reach more effective CCM targets.

In addition, the literature on corruption and CCM is related to – and partly overlap with – research on lobbying and "undue influence." For example, there is literature showing how a small number of scientists, funded by industry, have managed to insert misleading information to successfully invoke doubt about the scientific consensus on climate change in the U.S. public discourse[32] (see [33]). There is also a long-standing observation regarding behaviors such as the "revolving door," where close ties between industry and public officials risk leading to reciprocated privileges and even regulatory capture[34]. Whether such behavior is considered corruption is still under debate in academia and beyond.

Another vein of research that we believe should gain more attention is the possible unintended negative impact from much-needed investments in CCM-related efforts on corruption. To illustrate, when money is invested in corrupt settings, this sometimes benefits actors that thrive through bribery. With huge monetary flows directed to CCM in the coming years – such as the REDD+ program to conserve tropical forests or infrastructure investments in green energy – we will likely witness examples of how officials and criminals collude to siphon funds from the donor's CCM goal. Such unwanted outcomes are illustrated in the study by Gennaioli and Tavoni[35], on wind power development in Italy, or the study by Sovacool[36], on renewable energy in Mexico, Malaysia, Kenya, and South Africa. Research on these processes, and especially on how to minimize such risks, will be beneficial for future CCM efforts.

Although *adaptation* to climate change is outside the scope of this review, it is worth highlighting the need for in-depth work on understanding the complex process of how corruption constitutes an additional hurdle for effective and equitable adaptation. For example, Rahman's[37] study of forest-dependent communities in Bangladesh documents how the extra toll of corruption amongst officials and criminal gangs adds pressure to an already exposed group, where harm from climate change is potentially extreme. As such, corruption exacerbates vulnerabilities related to climate change for these communities. Understanding linkages between corruption and climate change adaptation is a pressing issue for future research.

Finally, we note that some scientific disciplines seem to be more engaged in understanding how corruption affects climate change mitigation. A considerable share of the studies we analyzed are written by economists and published in economics journals. We find this somewhat surprising, given that corruption is of interests for other social science disciplines, including law, political science, sociology, and psychology. However, very few of the studies are published in journals from these fields. More engagement by scholars from these disciplines could enrich our insights on the links between corruption and CCM.

To conclude, hitherto research establishes that corruption hampers climate change mitigation with numerous insights into how these processes materialize. Still, the research community ought to pay considerably more attention to the aforementioned how-questions. This can be done in at least two ways: either by paying larger attention to causal mechanisms and/or by investigating how the negative impact of corruption on CCM can be bypassed. These are both important avenues for future research as corruption will cause many countries to face considerable challenges in reaching their Nationally Determined Contributions.

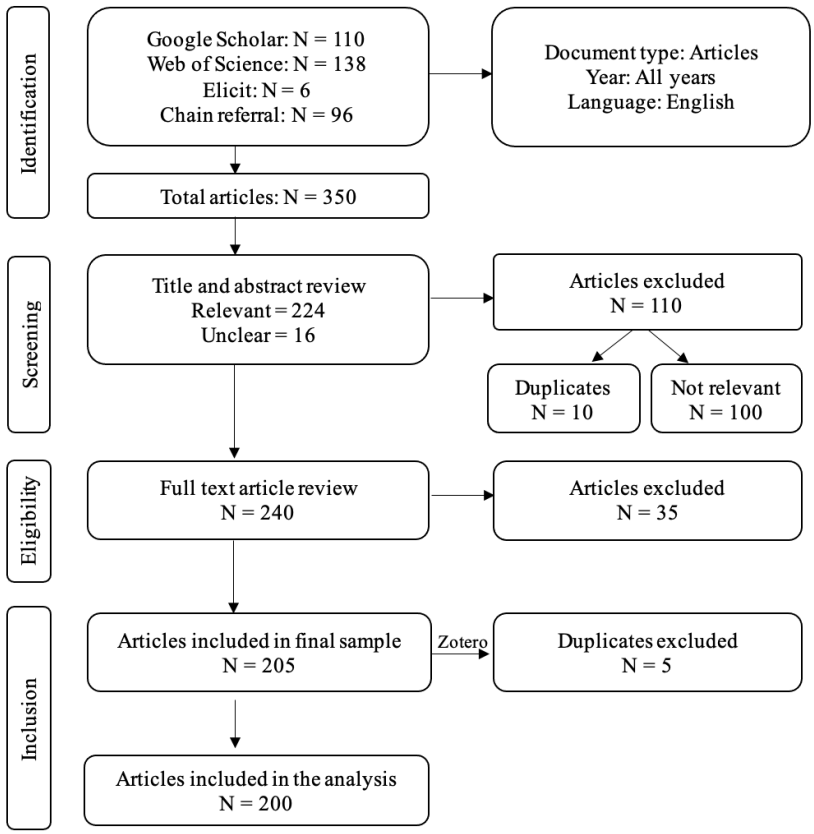
4. METHODS

To create the sample of literature for our review, we used three search engines: Google Scholar, Web of Science, and Elicit (more information about search words are given in Appendix F). In addition, we used a method of chain referral and examined the bibliography of the articles that we found through search engines to identify further relevant studies. We limited our search to published works and primarily left aside unpublished working papers. We only covered articles in English and did not limit our search to specific years. Figure 7 visually describes our process of identifying the final sample. After creating a list of articles (identification), we went through the titles and the abstracts to evaluate the articles for relevance and excluded those articles that did not directly relate to corruption, climate change mitigation, deforestation, or overfishing (screening). For instance, we excluded empirical studies that investigated the relationship between corruption and environmental policies and outcomes or sustainability in general. We included theoretical studies on corruption and environmental policies, as they are also relevant for understanding climate policy-making. After this scanning of abstracts and titles, we proceeded with reading the full texts of the remaining relevant articles, examining them for eligibility and discarding duplicates (inclusion). The 200 studies are listed in Appendix G.

We then created a coding scheme for which we evaluated every study and assessed their key characteristics on the relevant factors including, for instance: the direction of the effects found in a

study, the geographical and temporal coverage, the methods used, the data on corruption and outcomes used, if a study covered GHG emissions or carbon sinks, if a study covered the adoption or implementation of climate policies, and if a study focused on grand or petty corruption. We also noted which journal the study was published in, and in addition, investigated the current affiliation of the articles' authors to analyze from which discipline the study came. Articles excluded at this stage included studies that focused on reverse causality, that is, if climate mitigation projects spur corruption, and studies that did not explicitly focus on corruption or climate change mitigation. We also excluded studies that did not precisely deal with corruption but rather studied related concepts, such as rule of law, good governance or democracy. A further delimitation was the exclusion of studies on climate change adaptation.

Figure 7. Flowchart of article search and screening



Note: Data collection took place in August 2022-February2023.

Author contribution

A.S. initiated the study. A.S, N.H., S.C.J and M.P. conceptualized the paper. M.P. instructed RA's in data collection. A.S. collected some of the data. A.S., N.H., and M.P. analyzed the data. Finally, A.S, N.H., S.C.J and M.P. wrote the main manuscript.

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APPENDICES

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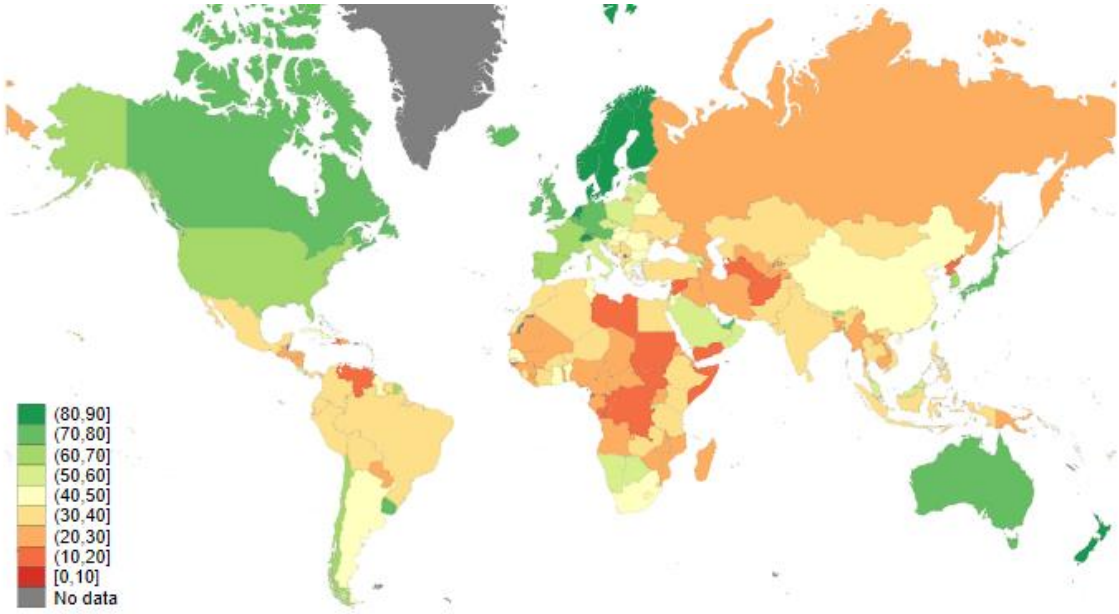
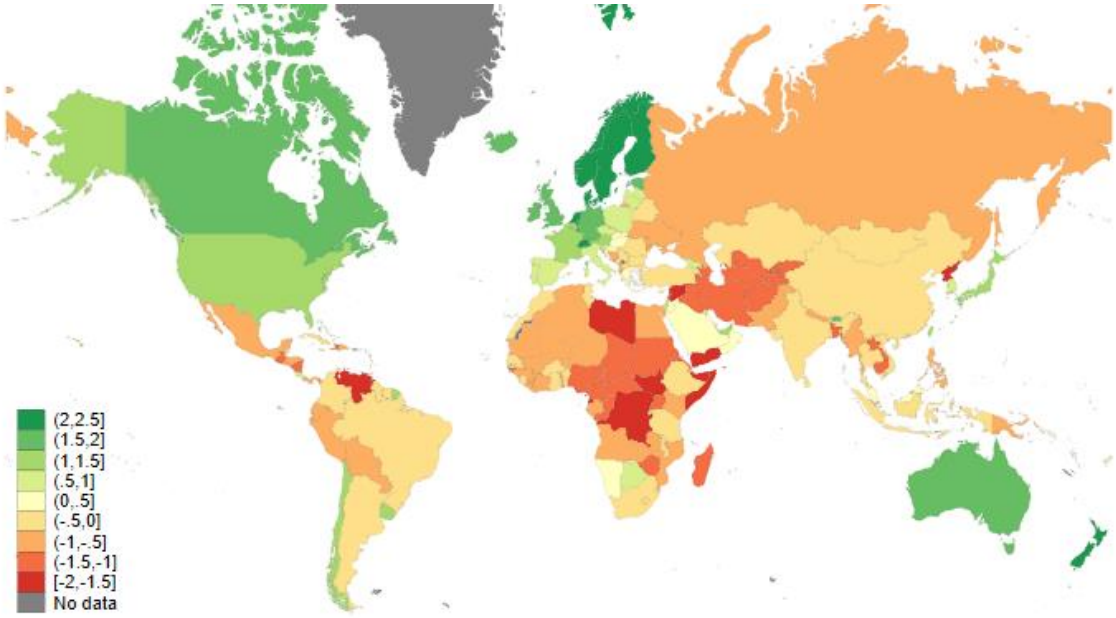
Appendix A. Corruption world maps

Figure A.1. Global map of Corruption Perception Index (Transparency International 2023)



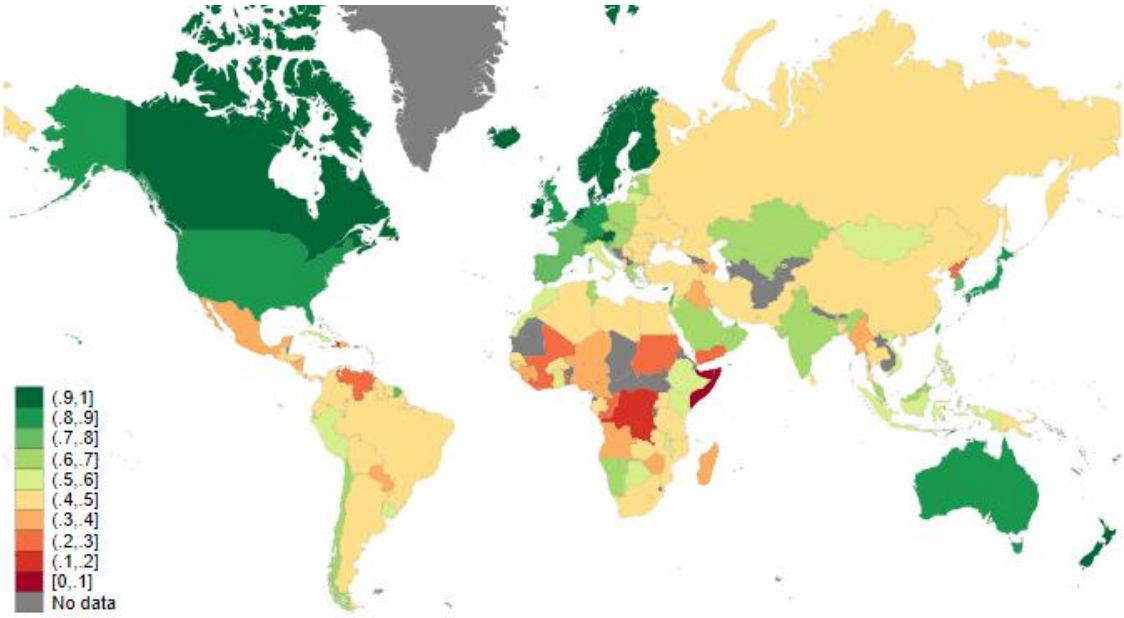
Note: The CPI Score relates to perceptions of the degree of corruption as seen by business people, risk analysts and the general public and ranges between 0 (highly corrupt) and 100 (highly clean).

Figure A.2. Global map of Control of Corruption Estimate (Worldwide Governance Indicators 2023)



Note: Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Figure A.3. Global map of Quality of Government from the International Country Risk Guide (PRS Group 2023)



Note: The mean value of the ICRG variables 'Corruption', 'Law and Order' and 'Bureaucracy Quality', scaled from 0 to 1. Higher values indicate higher quality of government.

Appendix B. Sub-trends in research on corruption and CCM.

When we split our sample and look at articles on deforestation and overfishing (sinks) and articles on GHG emissions-related outcomes separately, we see that there has been an increasing number of publications, both among those focusing on sinks and those focusing on emissions. However, the increase is substantially larger among the articles related to GHG emissions, as illustrated in Fig B.1. While the annual number of articles published on corruption and carbon sinks increased from 1 to 5 before the year 2015 to 5 to 10 after 2015, the annual number of articles on GHG emissions increased from 1 to 10 before the year 2015 to 10 to 20 after 2015. This trend is also mirrored in the accumulated growth of studies (see Fig B.2). In our sample, about 70% of the studies focus on GHG emissions rather than carbon sinks (about 30%).

Fig B.1 Number of articles published per year on corruption and carbon sinks (left) and corruption and GHG emissions-related outcomes (right)

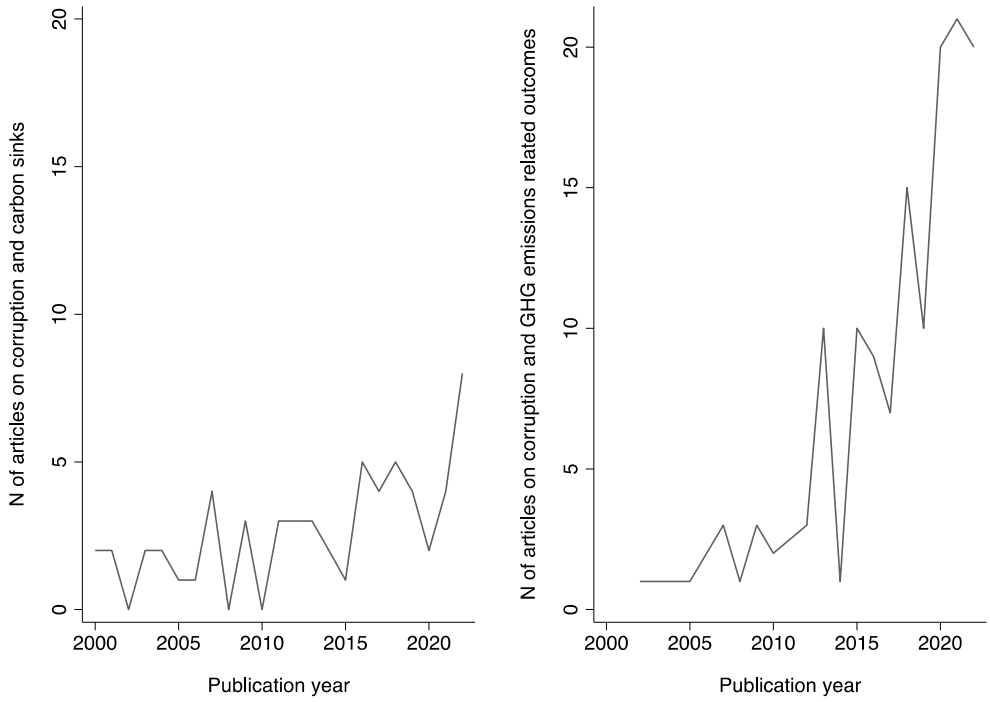
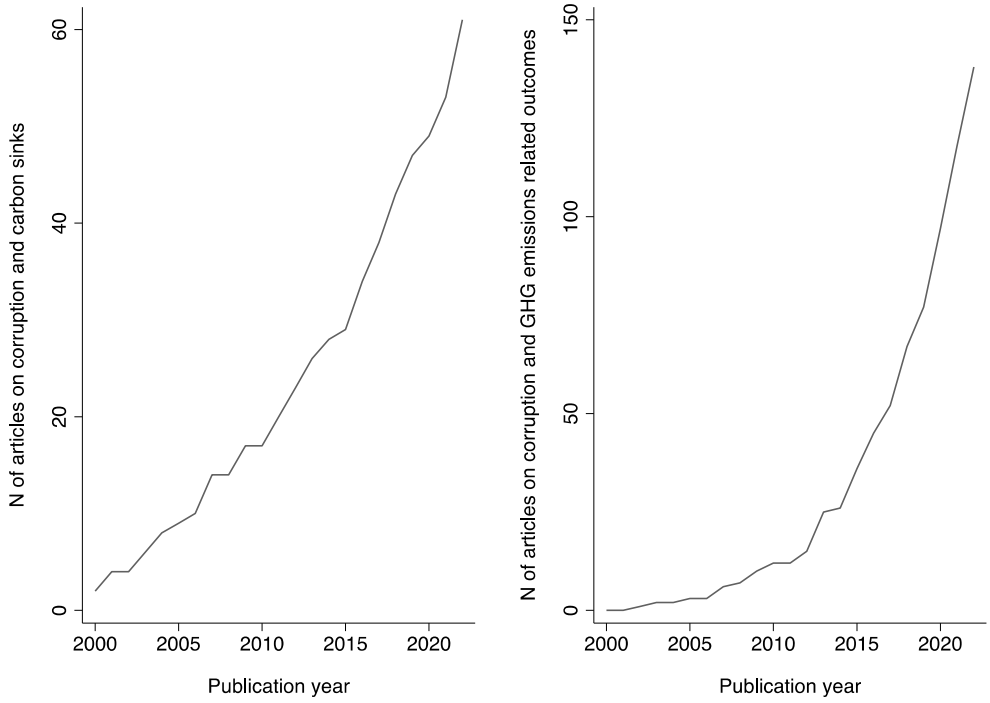


Figure B.2 Accumulated growth of articles on corruption and carbon sinks (left) and corruption and GHG emissions-related outcomes (right)



Appendix C. Scope of previous related review articles

Our sample of 200 articles should be compared to the estimated number of studies on the theme of corruption and a climate-related outcome in previous overviews: 37 in Sundström[1], 14 in Dasgupta and De Cian[2], 73 in Tacconi and Williams[3], 24 in Hu et al.[4], 23 in Povitkina and Matti[5], and 40 in Sommer[6]. These numbers are estimations made by this review's authors and should be seen as approximations, as some articles in these reviews are related to but not exactly on this theme.

Appendix D. Geographic distribution of single-case studies.

Fig D.1 Single-country studies on corruption and GHG emissions

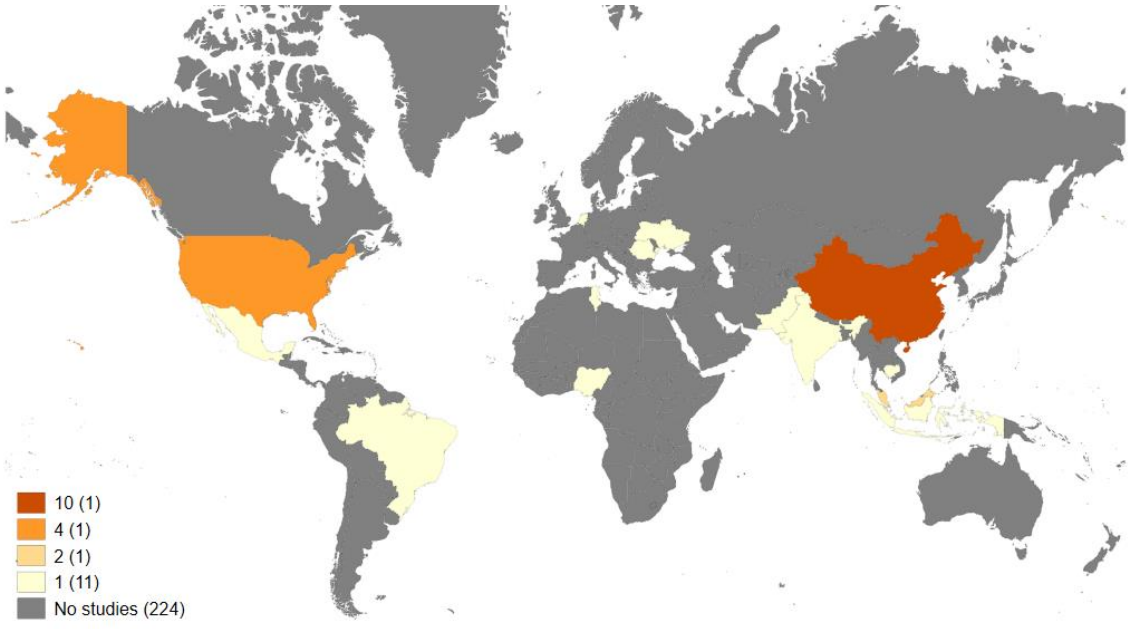
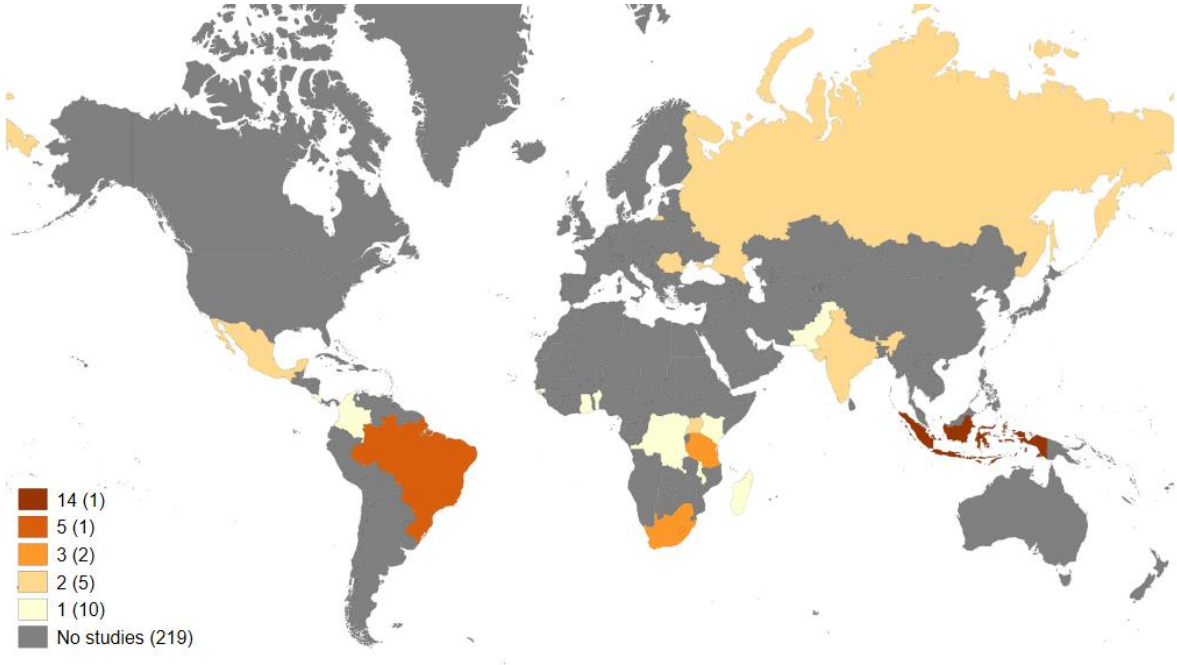


Fig D.2 Single-country studies on corruption and carbon sinks



Appendix E. Cross-country measures used in the literature.

To capture or measure *corruption*, studies heavily depend on three indices: the Control of Corruption measure from the World Bank's Worldwide Governance Indicators (58 studies)[7], the Transparency International's Corruption Perception Index (34 studies)[8], and the Quality of Government measure from the International Country Risk Guide (22 studies)[9], where several studies have also redone analyses using different measures for robustness checks. Other data sources used are the corruption measures from the Varieties of Democracy project[10], Quality of Government Expert Survey[11], as well as the Bayesian Corruption Index[12], which combines multiple corruption measures into one. Very few studies have collected their own quantitative data on corruption.

When it comes to *sinks*, quantitative studies on deforestation primarily rely on data from UN's Food and Agriculture Organization (FAO) and the Global Forest Change Dataset[13], based on satellite data. We have seen great methodological advancements the last couple of decades with more sophisticated measures, for example using satellite data of deforestation. We have not seen the same trend on fisheries, because this tends to be studied with qualitative methods.

When studying the effect of corruption on *GHG emissions*, researchers primarily look at CO_2 emissions. Data on CO2 emissions come from various sources (such as the World Bank[14] and the Emissions Database of Global Atmospheric Research[15]). The approach to measuring CO2 emissions is also different: most studies use metric tons per capita, while a few studies use CO_2 per energy output or GDP. The most widely used measures are national and do not include emissions from consumption. Furthermore, studies do not include international emissions (i.e. transport). The majority of studies use a measure from the World Development Indicators[16]. However, some also use OECD statistics based on national submissions to UNFCCC[17]. Country-specific studies use local data sources, e.g., data from

actors such as the Energy Information Administration in the United States or the China Statistical Yearbook.

Appendix F. Information about search terms.

Based on our understanding of how corruption affects the climate policy cycle, we had a good idea of which search terms to use. The search terms for articles related to GHG emission included: various combinations of {corruption, bribery, embezzlement, vote-buying, clientelism, kickbacks, State capture, patronage, favoritism, nepotism, cronyism, racketeering, extortion, graft, pressure groups, donations, campaigns} and {climate policy, climate change, climate change mitigation, climate laws, greenhouse gas, climate policy, environmental policy, poor climate policy, nature, air pollution, CO2, climate agenda setting, climate policy implementation, emission policy}. The search terms for articles related to carbon sinks included: the impact of corruption on deforestation, corruption and deforestation, campaign donations and deforestation, election cycles and deforestation, clientelism and deforestation mining, corruption and deforestation, lobbyism and deforestation, corruption and agricultural expansion, impact of clientelism on deforestation, forest change and patronage, fisheries and corruption, fish* and corruption.

Appendix G. List of the 200 studies analyzed in the review.

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