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Implementing market mechanisms in the Paris era: the importance of bureaucratic capacity building for international climate policy

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ABSTRACT


At the 26th Climate Change Conference of the Parties, scheduled for November 2021, negotiators will finally decide on the future of international carbon markets under the Paris Agreement. While several issues still need to be solved, this 'policy impact forum' article seeks to raise awareness of an important challenge that must be dealt with at the implementation stage: the lack of national administrative capacity. We argue that no matter how international carbon markets will ultimately look like under the Paris Agreement, low-capacity countries will find it difficult to build up the institutional structures needed to successfully participate in carbon markets. International support for bureaucratic capacity building can help to overcome this barrier. The implementation of market mechanisms under the Paris Agreement must thus be accompanied by increased investments into international cooperation and bureaucratic support programmes. We substantiate our argument with an empirical analysis of the market mechanisms used under the Kyoto Protocol.

KEYWORDS capacity building; carbon markets; COP26; climate change; Paris Agreement

Introduction

As the outbreak of the COVID-19 pandemic continues to disrupt lives, travels and business across the globe, governments have decided to postpone the 26th Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change to November 2021. A central issue that needs to be solved at COP26 is to agree on the rules for 'Article 6' that set the basis for new international carbon markets. Some of the key technical considerations raised in relation to 'Article 6' are, amongst others, to ensure that carbon trading delivers real CO₂ savings and avoids the 'double counting' of traded emission reduction units.

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In this 'policy impact forum' article, we intend to raise awareness of another key challenge for the proper functioning of international carbon markets: We argue that no matter how international carbon markets will ultimately be designed under the Paris Agreement, especially developing countries need to boost their administrative capacities to be able to successfully participate in these markets. International support for bureaucratic capacity building can help to overcome this barrier. Therefore, policy-makers should ensure that the implementation of market mechanisms under the Paris Agreement is accompanied by increased investments into international cooperation and bureaucratic support programmes.

We substantiate our argument by drawing lessons from the Clean Development Mechanism (CDM), i.e., one of the central parts of the international emissions trading scheme under the Kyoto Protocol. The Kyoto Protocol was the first international agreement among countries to mandate reductions in greenhouse gas emission and, this way, can be seen as the predecessor of the Paris Agreement. Hence, experiences from the implementation of the Kyoto Protocol's market mechanisms provide important lessons that can inform policy learning about how to make international market mechanisms work in the Paris era and beyond. We show that low administrative capacities were a key constraint for the proper functioning of the Kyoto Protocol's market mechanisms. However, we also find that international bureaucratic support programmes helped countries to establish necessary domestic bureaucratic institutions. This, in turn, improved countries' participation in the market mechanism scheme of the Kyoto protocol substantially. In sum, these findings stress that boosting administrative capacity is a key precondition for making international market mechanisms work. In consequence, the future success of international climate cooperation schemes crucially depends on countries' implementation capacities. To leverage their full potential, the implementation of market mechanisms under the Paris Agreement should be accompanied by massive investments into international cooperation and bureaucratic support programmes.

The remainder of this article is structured as follows: First, we discuss the well-known challenges to policy implementation in the light of international climate policy-making. In particular, we stress the importance of bureaucratic capacity for implementing market mechanisms to reduce carbon emission in developing countries. Afterwards, we argue that external support to build environmental administrative institutions can help to overcome barriers of environmental policy implementation. Using the Kyoto Protocol's CDM as an empirical illustration for our argument, we show that countries with higher overall bureaucratic capacity were quicker at establishing crucial domestic environmental institutions and were more successful at attracting CDM projects. Subsequently, analysing a novel dataset on bureaucratic support programmes, we find that administrative support helped countries to build

domestic environmental institutions and to attract more CDM projects. The final section concludes by stressing that international support for bureaucratic capacity building is central for the success of future emission trading in the Paris era.

International climate agreements and the well-known challenges of policy implementation

The obstacles to the effective implementation of international climate agreements come in various forms (Oberthur & Groen 2018). There are many points at which things can go wrong – despite the best intentions of the actors involved. As we know from the literature on policy implementation in the European Union (EU) context, policy implementation can be divided into three broader substages (Bondarouk & Mastenbroek 2018). The first one is the stage of *policy transposition* (Steunenberg 2006; Zhelyazkova 2013). Here, national governments must integrate international agreements into their national law before national or subnational administrations or agencies can start pursuing the respective policy goals (Toshkov 2007; Zhelyazkova, Kaya & Schrama 2016). Yet, even after the formal transposition of a policy there are still a lot of decisions to make (Hupe and Hill 2016, pp. 106–107). The *final policy formation* thus takes place ‘on the ground’. This step involves the national authority’s efforts to operationalize the abstract international agreement and national policies for practical purposes (Hill and Hupe 2003; Newig and Koontz 2014). Implementing authorities must, for instance, specify the exact provisions under which a given person or organization is authorized, assigned, or permitted to exercise a given operation. Moreover, this step typically involves the establishment of the administrative bodies in charge of implementation and the assignment of policy responsibilities (Crosby 1996). If this step is completed, the process of *policy delivery* starts (Winter, 2012). This third implementation stage is characterized by finally putting policy into practice. Depending on the policy in question, this can involve a range of different activities such as the carrying out of on-spot inspections, the granting of permits, or the coordination between different private and public actors (Thomann et al. 2018).

Studies on policy implementation have identified a range of aspects that play a role in explaining policy differences and outcomes along the various stages of the implementation process. In so doing, they highlight both international and national factors as crucial determinants of implementation patterns. One of the most important aspect that is consistently supported in the literature is the notion that well-coordinated and -equipped administrations are central for the effective functioning of public policies (Thomas 2018). Only when national bureaucracies possess a sufficient degree of expertise, supporting staff, and resources, they can transfer international agreements into

concrete national policies and integrate the 'abstract' policy goals into the country's legal architecture and administrative tradition (Borzel & Buzogany 2019; Dimitrova 2002; Knill & Hille, 2006). The very same argument can be made about the final policy formation 'on the ground' and the process of implementing agency design and creation. Peters (2010), for instance, argues that institutional design is in many ways the 'function' of pre-existing institutions. In other words, only well-designed and -managed administrations are able to create public authority that can live up to these standards. Lastly, administrative capacities are indispensable for the smooth operation and delivery of policies. To ensure that citizens and businesses abide by the rules, their action must be continuously authorized, monitored as well as controlled, and if necessary, sanctioned. The extent to which implementing authorities can carry out the respective activities depends on their human capacity as well as on the financial, technical, and organizational resources available (Limberg, et al. 2021).

In the context of international climate cooperation in general and the establishment of carbon markets in particular, the presented challenges are especially pronounced (Lederer & Höhne, 2021; Fankhauser & Lavic, 2003). Here, low-capacity countries must implement a type of policy that is often entirely 'new' to the national bureaucracy. Therefore, these countries typically need to adapt or create (new) administrative structures and procedures (Spash 2010; Stender, et al. 2020). For instance, this involves the establishment of a solid legal framework that lays out under which exact conditions activities are licenced for trading and ensures the rights of both potential investors and domestic businesses and citizens. Moreover, government must set up or assign public authorities that process applications for authorization and later on control the compliance with the admission requirements. As a consequence, any climate agreement that (1) involves both developed and developing countries and that (2) promotes carbon markets must ensure that all treaty parties possess the ability to develop the bureaucratic infrastructure necessary to successfully participate in emission trading. Where these capacities are missing, other countries and international organizations must step in and assist countries to build up the institutional structure needed.

Substantiating the argument: lesson drawing from the clean development mechanism

We substantiate our argument by drawing lessons from the Clean Development Mechanism (CDM). The CDM was the world's first *international* market-based mechanism to reduce greenhouse gas emissions, established under the Kyoto Protocol. Under the CDM, industrialized countries (Annex B countries) can fund carbon projects in developing countries (Non-Annex

B countries) to offset their emissions at home. Given that emission reductions in developing countries can be realized in a more cost-effective way, developed countries can achieve their reduction targets at a much lower price. Developing countries, in turn, can profit from attracting foreign investments and the transfer of clean technologies. Article 6 of the Paris Agreement is intended to replace the CDM by the Sustainable Development Mechanism (SDM). Any insights from CDM thus provide valuable insights for the future design and improvement of international carbon markets.

Our empirical illustration unfolds in two steps. First, we show that countries with low levels of national administrative capacities (*Ia*) took longer to establish the necessary institutional structures to participate in CDM and, furthermore, (*Ib*) attracted less CDM projects. In consequence, substantial climate cooperation potential remained largely untapped. Thereafter, we show that the assistance by international organizations (IOs) and the mutual support among countries can help to overcome the resulting implementation deficits. Countries that received institutional support from abroad were both (*IIa*) faster in establishing the necessary institutional structures as well as (*IIb*) more successful in attracting CDM projects.

Following this reasoning, we make the (tacit) assumption that both the participation in international carbon markets and the attraction of carbon offset programs is desirable and, in consequence, an inherently 'good thing'. Given that there is a discussion about the (negative) social and environmental impacts of these projects (see e.g., Schneider, 2011), it is doubtful whether this is always the case. Yet, we stick to these 'performance criteria' given that a more general discussion on the pros and cons of international carbon trading schemes is clearly beyond the scope of this contribution.

Empirical illustration

The central institutional precondition to participate in the Kyoto Protocol's CDM is the establishment of a so-called Designated National Authority (DNA). A DNA is an organization which is granted responsibility by the respective government to implement and operate the CDM at the national level. The responsible authorities assess whether the submitted project proposals comply with the country's overall political and legal framework and whether they conform to the national sustainability agenda as well as the priorities of local communities. Thus, DNA is the central bureaucratic 'bottle-neck' at the national level. [Figure 1](#) visualizes this by showing the yearly number of CDM projects four years before and after the establishment of a DNA in a respective country.

Are countries with low overall administrative capacities laggards in establishing these important institutional preconditions for participating in the

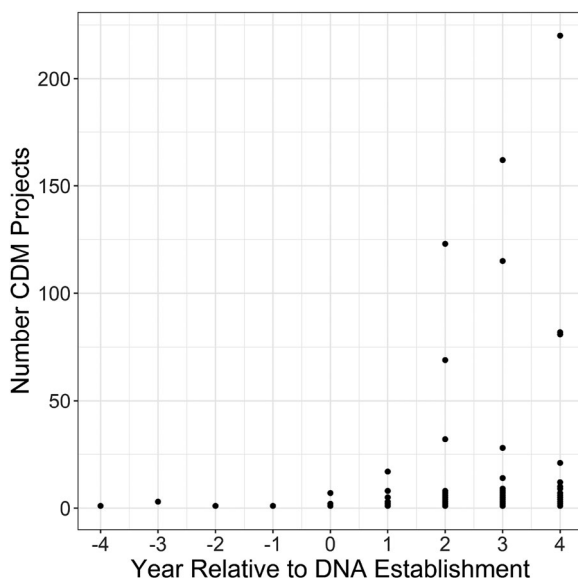


Figure 1. CDM projects before and after DNA establishment.

Data: Own coding and CDM UNFCC (2020).

CDM (Ia)? To gain empirical insights into this question, we created a novel dataset that entails information on whether and, if so, when governments established their respective DNA.¹ We map this data against the general level of a country's bureaucratic capacity as proxied via the Government Effectiveness Indicator from the Worldwide Governance Indicators (WGI) project (World Bank, 2018a). This indicator combines several variables that measure 'the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies' (World Bank, 2018a). It is a fairly standard measure when interested in the role of the administration in implementation and transposition (Knill & Hille, 2006) and encompasses a number of variables which have been previously employed to capture administrative capacity, such as the International Country Risk Guide's 'Bureaucracy Quality' indicator (Cingolani et al., 2015).

Figure 2(a) visualizes the relation between national bureaucratic capacities as measured via the World Banks' Government Effectiveness Indicator and the year of DNA creation.² The overall domestic bureaucratic capacity of a country is negatively correlated with the year a DNA was established.³ Thus, in line with proposition Ia, countries with a higher overall bureaucratic capacity were quicker at creating a DNA. On average, countries with a one-point higher level of the Government Effectiveness Indicator

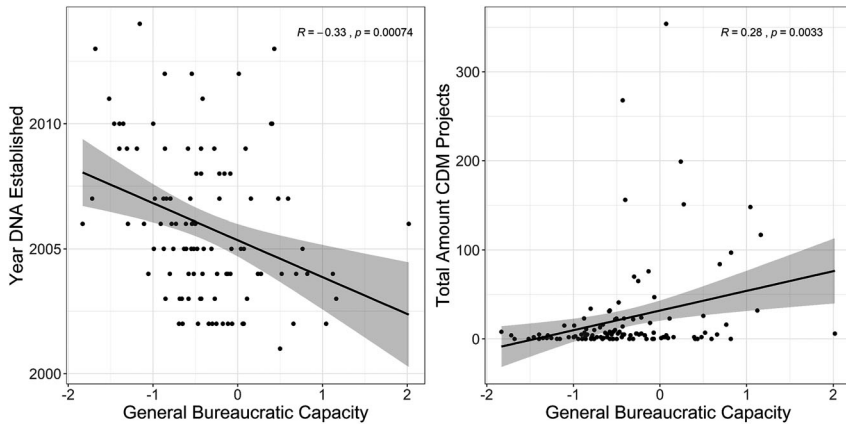


Figure 2. a&b: National bureaucratic capacities, DNA creation, and number of CDM projects.

Data: Own coding, CDM UNFCC (2020), and World Bank (2018a).

introduced a DNA two years earlier. In other words, countries with a higher overall bureaucratic capacities were quicker at establishing the institutional preconditions to participate in international market-based schemes to reduce carbon emissions.

Furthermore, we look at whether countries with high overall bureaucratic capacities were more successful in securing CDM projects (1b). Again, we take the Government Effectiveness Index to measure national administrative capacities. Moreover, we take data on the total number of projects that a country has hosted since the start of the CDM in 2004. Data on CDM projects come from the United Nations Framework Convention on Climate Change (UNFCC) (2020). Figure 2(b) shows the relation between domestic administrative capacity and the amount of CDM projects. Overall, countries with a higher bureaucratic capacity were more successful in attracting CDM projects.⁴ Countries with a one-point higher score of the Government Effectiveness Indicator hosted, on average, 22 more CDM projects.⁵ This correlation is in line with proposition 1b which stated that countries with low administrative capacities are less able to attract CDM projects.

These findings perfectly resonate with more 'qualitative' insights on the importance of bureaucratic capacities in the context of DNA creation and CDM participation. Okubo and Michaelowa (2009), for instance, report that the delay of the establishment of DNAs in Sub-Saharan Africa were due to 'difficulties in [both] setting of sustainable development rules' and in identifying 'which governmental department should host the DNA' and, this way, write the regulations to govern the operation of the DNA (p. 15). In a similar vein, Plöchl et al. (2010) state that a major reason for the inequitable

distribution of CDM projects is the 'need for additional capacities in the public sector' and that the lack of 'institutions necessary to facilitate (and also promote) CDM' (p. 8).

The role of bureaucratic support programmes

In the previous section, we have used the case of the Kyoto Protocol's CDM to illustrate that countries with a lower overall administrative capacity were slower at establishing core institutions to participate in international carbon reduction schemes. Furthermore, we have seen that low-capacity countries were less successful in attracting CDM projects. In other words, bureaucracy strongly matters for the implementation of market-based international climate schemes. This is very much in line with recent research that has stressed the role of administrative structures for environmental policy implementation (Bondarouk & Mastenbroek 2018; Steinebach 2019).

In sum, lacking administrative capacities constitute severe problems for market-based international schemes to reduce carbon emissions. Thus, thinking about how these barriers can be overcome is crucial for designing carbon markets under the Paris Agreement. One of the most promising factors is external support for bureaucratic capacity building. External support by both international organizations (IOs) and other countries to assist and support countries in building their national institutional arrangements can help to overcome the implementation deficits of market mechanisms.

Again, we use the Kyoto Protocol's CDM to illustrate this point empirically. More specifically, we look at the effect of bureaucratic support programmes by IOs and developed countries. We can broadly differentiate between two types of support programmes. The first type refers to general support workshops that share information on the CDM with developing countries, raise awareness of the scheme and assess a country's potential and feasibility of hosting CDM projects. The second type of support programme is more specific and aimed at training bureaucrats, developing a country's sustainable criteria, helping to develop the institutional legal framework to establish a DNA, and helping countries to improve the national modalities and procedures leading up to DNA project approval. The tiny island state of Mauritius, for instance, quickly recognized the need to establish a robust legal framework to promote foreign investment in CO₂ reduction projects and to allow for an efficient CDM project approval process. Under the header of the 'Capacity Development for Clean Development Mechanism' (CD4CDM) run by the UNEP (United Nations Environment Programme), the Mauritanian Ministry of Environment created the responsible authority, drafted a comprehensive regulation on CDM and streamlined the approval procedure with other processes on environmental impact assessment processes and public participation requirements. This way, Mauritius became one of the first

African countries with a comprehensive CDM legal framework participating in the international carbon offset scheme (Curnow & Hodes 2009).

We start by testing whether countries that have received bureaucratic support were quicker at establishing a DNA. Here, we focus on bureaucratic support programmes at the early stage of CDM creation because initial capacity building creates particularly decisive and long-lasting advantages. The better prepared countries are at an early point, the more time they have (1) to build up trust relationships with countries being interested in offsetting their emissions abroad and (2) to gain experience and knowledge in CDM administration. We construct a database on bureaucratic support programmes in the first five years after the Kyoto protocol was agreed upon (1998 to 2002), drawing on information provided by Silayan (2005), Okubo and Michaelowa (2009) as well as on additional country reports and international organizations' documents. The years 1998 to 2002 can be considered as the (early) implementation period of the Kyoto Protocol. Hence, the respective period is most comparable to today's situation with regard to the Paris Agreement. Moreover, from a theoretical point of view, we can expect that early-stage differences can lead to particularly decisive and long-lasting (dis)advantages. The better prepared countries are at an early point, the more time they have to build up trust relationships with countries being interested in offsetting their emissions abroad to gain experience and knowledge in CDM administration by running projects. This latter aspect, in turn, reduces the (transaction) costs involved in the projects starting later on and, in consequence, increases a country's overall attractiveness as a CDM host. Based on this information, we create a dummy variable which takes the value '1' when a country has received any institutional support. In total, we end up with full information on 89 countries. 43 of these countries have received at least one bureaucratic support programme.⁶

To find out whether bureaucratic support has boosted environmental institution building by facilitating the creation of DNAs, we run event history analyses. Simply put, these models allow us to estimate whether countries with bureaucratic support programmes were quicker at establishing a DNA.⁷ To account for potential alternative explanations, we include a battery of covariates into our model. We control for democratic structures by including for the liberal democracy index from the V-DEM project (Coppedge et al., 2019). Furthermore, economically more developed countries might be more capable of establishing a DNA. We control for gross domestic product (GDP) per capita (logged values) to account for this (World Bank, 2018b). Also, existing climate mitigation potential could matter for DNA creation. Therefore, we include a variable that control for CO₂ emissions measured in metric tons per capita (World Bank, 2018b). Another crucial factor of participating in the CDM is guaranteeing property rights. Thus, we also include a covariate from the V-DEM project that measures domestic

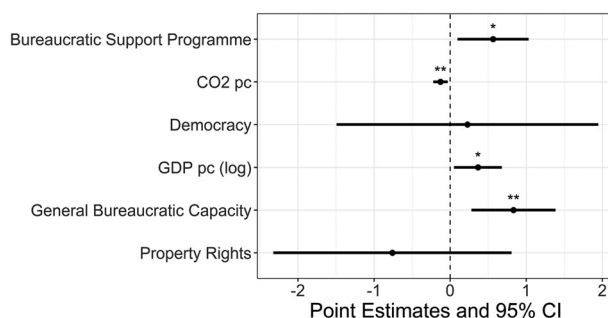


Figure 3. Results event history analysis for DNA creation.

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

property rights (Coppedge et al., 2019). Finally, as we have illustrated above, countries' overall institutional capacities matter. Countries with a higher overall level of bureaucratic capacity are very successful in attracting CDM projects. We account for this by including the World Bank's government effectiveness indicator in our models (World Bank, 2018a).

Figure 3 shows the results of the event history analysis.⁸ The dots represent the estimated effect of each variable and the bars represent the corresponding confidence intervals for the 95 per cent level. For instance, a variable leads to quicker DNA creation if its point estimate is positive. This effect is statistically significant if the confidence interval does not include the '0'. In line with *Ila*, the coefficient for bureaucratic support programmes is positive and statistically significant at the 95 per cent level. Hence, countries that received at least one bureaucratic support programme were quicker at establishing a DNA. Figure 4 visualizes this finding. The graph plots the expected survival curve for countries with and without a bureaucratic support programme. We can see that countries which previously received bureaucratic support were clear frontrunners in creating DNAs whilst countries without bureaucratic support were laggards. After six years, countries that received a bureaucratic support programme were more than twice as likely to have introduced a DNA. These findings show strong support for our argument that bureaucratic support boosted domestic environmental institutional capacity.

When turning to the covariates, we can see that countries with a higher overall bureaucratic capacity are quicker at establishing a DNA. This is in line with *Ia*. This finding also supports the descriptive patterns identified in Figure 2(a). Furthermore, the coefficient for CO₂ emissions per capita is negative. Also, countries with a higher GDP per capita tend to be quicker at creating DNAs. Finally, the democracy coefficient is positive whilst the coefficient for property rights is negative. However, neither coefficient reaches conventional levels of statistical significance.

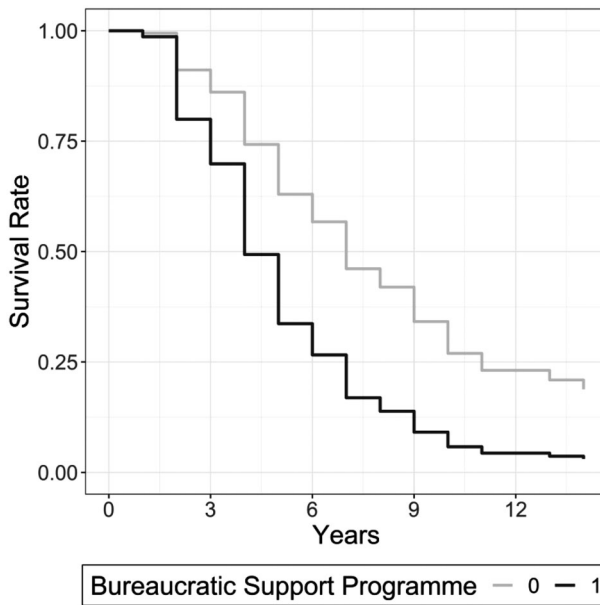


Figure 4. Effect of bureaucratic support on DNA creation.

Notes: Calculation based on Table A1, Model 2.

So far, we have shown that countries which received external bureaucratic support were faster in establishing DNAs, i.e., the necessary domestic environmental institutions of the CDM (*IIa*). But were countries that received these institutional support programmes also more successful in attracting CDM projects (*IIb*)? We test whether bureaucratic support programmes have had an effect on the total number of CDM projects that a country has hosted by running negative binomial regression analyses. We include the same set of covariates that we used in the previous analysis.

Figure 5 shows the regression results.⁹ Again, the plot shows the point estimates for each variable and the confidence intervals. A positive point estimate means that a variable is associated with more domestic CDM projects. The coefficient for our bureaucratic support programme variable is positive and statistically significant at the 99.9 per cent level. Thus, countries that received bureaucratic support were more successful in attracting CDM projects (*IIb*). Regarding the control variables, we find that countries with higher general bureaucratic capacity hosted more CDM projects. Again, this is in line with the correlational patterns we have seen in the previous section. Furthermore, GDP pc (logged values) and property rights are negatively associated with the number of CDM projects. This surprising correlation might be explained by the fact that both factors are already highly correlated with a country's overall level of bureaucratic capacity.

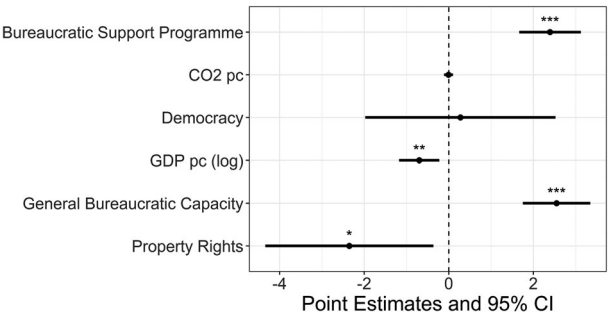


Figure 5. Results negative binomial regression for number of national CDM projects.
Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

As described earlier, we can differentiate between (1) general bureaucratic support programmes that focus on sharing information, raising awareness, and assessing a country’s potential and (2) specific support programmes that focus on administrative training and building a legal framework. In order to differentiate between these types of bureaucratic support, we additionally coded whether a country received any general and/or any specific bureaucratic support programme. This allows us to compare the two types of bureaucratic support programmes. When running a model that includes both variables, we find that general as well as specific bureaucratic support programmes led to more national CDM projects (Figure 6). Both coefficients are positive and statistically highly significant. Whilst the point estimate for general bureaucratic support is slightly higher, the two estimates do not differ significantly. Hence, both types of bureaucratic support programmes promise to be powerful tools to improve the domestic capacities of countries to participate in carbon markets.

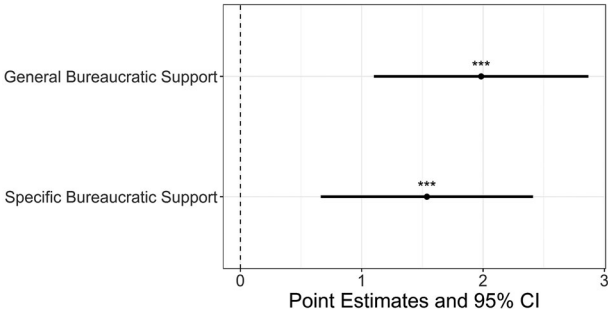


Figure 6. Results negative binomial regression for number of national CDM projects, general and specific bureaucratic support programmes.
Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Conclusion

What are the challenges of implementing market mechanisms to reduce carbon emissions in the Paris era? In this ‘policy impact forum’ article, we have argued that the lack of national administrative capacity constitutes a major obstacle to the successful functioning and implementation of international schemes to reduce carbon emissions. Bureaucratic support programmes that assist low-capacity countries in assessing the potential and feasibility of participating in carbon markets as well as in establishing the necessary national public authorities and legal framework can help to overcome this barrier. We have illustrated our argument by presenting evidence from the implementation of the Kyoto Protocol.

One argument that might go against our way of reasoning is that today’s situation is different to the launching period of the Kyoto Protocol, i.e., the early 2000s, as a substantial number of countries has already made at least some experience in handling carbon trading schemes. In consequence, drawing lessons from CDM implementation might lead to overly pessimistic conclusions. This is a fair point. Yet, one reason why the CDM ultimately failed was that projects were distributed very unequally among host countries. In particular, African countries were lacking their ‘fair share’ (Baimwera, et al. 2017) while about 70 percent of all registered projects were based in China and India (UNEP DTU 2021). This unequal distribution of benefits strongly undermined the global support for the CDM. The continuation of emission trading under Article 6 of the Paris Agreement *without* bureaucratic support programmes for low-capacity countries and *with* very unequal experiences in administering carbon markets easily runs the risk to further perpetuate existing inequalities.

Beyond these concrete recommendations, the analysis also holds some broader lessons for the discussion on international emission trading. It has frequently been argued in the literature that it is in particular the *hierarchical* forms of governmental intervention (regulations) that require strong administrative capacities due to the need for constant monitoring and enforcement. Market-based policy instrument such as international emission trading scheme, by contrast, are often portrayed as rather ‘self-executing’ and thus advisable under conditions of limited capacities (Howlett et al. 2009, p. 175). This paper, in contrast, has shown that market-based instruments are equally burdensome to implement and, this way, might suffer from the same shortcomings as more traditional ways of government intervention.

In sum, we can conclude that achieving an agreement on the ‘Article 6’ debate at COP26 will only be a first step towards a more inclusive and accessible model of international emissions trading. To leverage their full potential, the implementation of market mechanisms under the Paris Agreement must be accompanied by massive investments into international cooperation and bureaucratic support programmes.

Notes

1. The data were gathered from various sources. These were primarily the information made available online by the responsible authorities and the United Nations Framework Convention on Climate Change (UNFCCC). In addition, other sources such as academic contributions and the reports of international organizations were consulted.
2. The pattern remains similar when including the countries that have not introduced a DNA and setting their values at the year 2018, i.e. the end of our period of observation (Figure A1 in the Online Appendix).
3. Pearson's R is negative (-0.33) and the correlation is statistically significant at the 99.9 per cent level.
4. Note the variable for CDM projects is a count variable and highly skewed. Therefore, we have excluded the most extreme outliers in Figure 2b (China and India). However, Figure A2 in the Appendix presents a graph that allows for including these outliers as it looks at the natural logarithm of the number of CDM projects. The strong correlation remains.
5. The correlation between the two variables is statistically significant at the 99 per cent level.
6. There is no institution or dataset that has comprehensively collected all information on capacity building programmes. Hence, our data might miss some programmes. Yet, given the interest of both IOs and developing agencies in publicly advertising their own actions, we deem the risk of missing a substantial share of capacity building programmes as very low.
7. For a more technical description of our models, see the Online Appendix.
8. Calculation based on Table A1, Model 2.
9. Calculation based on Table A2, Model 2.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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