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SYNTHESIS ARTICLE

Effective and geographically balanced? An output-based assessment of non-state climate actions

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ABSTRACT

At COP21 in Paris, governments reiterated the importance of 'non-Party' contributions, placing big bets that the efforts of cities, regions, investors, companies, and other social groups will help keep average global warming limited to well under 2°C. However, there is little systematic knowledge concerning the performance of non-state and subnational efforts. We established a database of 52 climate actions launched at the 2014 UN Climate Summit in New York to assess output performance – that is, the production of relevant outputs – to understand whether they are likely to deliver social and environmental impacts. Moreover, we assess to which extent climate actions are implemented across developed and developing countries. We find that climate actions are starting to deliver, and output performance after one year is higher than one might expect from previous experiences with similar actions. However, differences exist between action areas: resilience actions have yet to produce specific outputs, whereas energy and industry actions perform above average. Furthermore, imbalances between developing and developed countries persist. While many actions target low-income and lower-middle-income economies, the implementation gap in these countries remains greater. More efforts are necessary to mobilize and implement actions that benefit the world's most vulnerable people.

Policy relevance

Climate actions by non-state and subnational actors are an important complement to the multilateral climate regime and the associated contributions made by national governments. Although such actions hold much potential, we still know very little about how they could deliver in practice. This article addresses this knowledge gap, by showing how 52 climate actions announced at the UN Climate Summit in 2014 have performed thus far. Based on our analysis, we argue that the post-Paris action agenda for non-state and subnational climate action should (1) find more effective ways to incentivize private sector actors to engage in transnational climate governance through actions that seek to reduce greenhouse gas emissions and promote climate resilience in a tangible manner; (2) identify factors underlying effectiveness, to take appropriate measures to support underperforming climate actions; and (3) address the large implementation gap of climate actions in developing countries.

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1. Introduction

The new agreement reached at the 21st Conference of the Parties (COP 21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris in December 2015 represents significant progress in international climate cooperation (Falkner, 2016). Getting to a climate-resilient and low-carbon future, however, is not just a matter for governments alone. With aggregated pledges by governments remaining far above pathways consistent with the global goal to limit warming below 2°C (Climate Action Tracker, 2015), additional actions by a diverse range of non-state and subnational actors could help close the global mitigation gap (Blok, Höhne, van der Leun, & Harrison, 2012). This potential was acknowledged in the COP decision accompanying the new agreement, which recognizes 'non-Party' stakeholders, such as civil society organizations, businesses, investors, cities, and regions, as key drivers of climate action, especially in the short term (prior to 2020), before the Paris Agreement's nationally determined contributions are implemented (Chan, Brandi, & Bauer, 2016). However, it is still unclear to what extent reliance on non-state and subnational efforts is a viable strategy to help bridge the global mitigation gap and to strengthen adaptation in the short term.

The many actions by non-state[1] actors announced in the run-up to COP 21 suggest a true 'groundswell' of climate actions. International organizations, in particular the UN system, have played an important role in brokering new cooperative climate actions, and in enhancing their visibility to a larger audience (see also Hale & Roger, 2014). In 2014, the UN Secretary-General convened a UN Climate Summit for leaders from government, finance, business, and civil society, inviting them to launch new climate actions. At COP 20, the UNFCCC secretariat, together with the Office of the UN Secretary-General, and the governments of France and Peru formed the 'Lima-Paris Action Agenda', again inviting state and non-state stakeholders to collaborate on new initiatives, resulting in 70 new climate actions. These actions are just a sample of the larger realm of transnational climate action. For example, since its launch in December 2014, the Non-state Actor Zone for Climate Action (NAZCA) platform has registered more than 11,500 climate actions, including not only pledges by individual actors (e.g. companies and cities), but also a number of multi-stakeholder 'cooperative initiatives'. The question is whether these actions effectively reduce GHG emissions and help vulnerable communities and ecosystems adapt to impacts of climate change. While this article does not address environmental and social impacts of climate actions, it provides a first comprehensive[2] analysis of actions launched at the 2014 UN Climate Summit, with a particular focus on developing a better understanding of their output performance, and their implementation across developed and developing countries. It asks two main questions, both addressed through an output-based assessment. First, how have climate actions performed so far? Second, how is implementation distributed across developing and developed countries?

With respect to the first question, any assessment of performance is conceptually and empirically challenging. The effectiveness of environmental regimes, for instance, can be measured by compliance, environmental and behavioural changes, or hypothetical counterfactuals (Andresen, 2013; Helm & Sprinz, 2000; Miles et al., 2002; Mitchell, 2008). Similar choices exist for the assessment of non-state climate actions. Given the relative novelty of most climate actions, an assessment of effectiveness in terms of actual environmental or behavioural impacts is not possible. Instead, most studies on the effectiveness of climate actions focus on *ex ante* mitigation potential (Cambridge Institute for Sustainability Leadership [CISL] & Ecofys, 2015; Galvanizing the Groundswell of Climate Actions, 2015; Graichen et al., 2016; Hsu, Moffat, Weinfurter, & Schwartz, 2015; Roelfsema, Harmsen, Olivier, & Hof, 2015; UNEP, 2015; Widerberg & Pattberg, 2014). However, a mere focus on mitigation potential may lead to unwarranted and overly optimistic estimations of climate actions, and evidence of *ex post* performance is necessary to evaluate how actions contribute to climate objectives in practice. This is especially the case for the actions launched at the 2014 UN Climate Summit. Within the UNFCCC regime, these actions are seen as part of 'pre-2020 enhanced action'; they are expected to deliver results in a relatively short time frame. An early indication of (potential) effectiveness is, therefore, desirable. Fortunately, climate actions can produce relevant and tangible outputs relatively quickly, even when changes in environmental or social indicators are not yet observable. The article therefore focuses on 'output effectiveness', that is, 'outputs or regulations and infrastructure created to move a regime from paper to practice' (Young, 2011, p. 19854). While output effectiveness does not guarantee problem-solving, climate actions that deliver specific and relevant outputs are more likely to achieve desired impacts in the longer term.

For the second question, this article examines the geographic distribution of implementation, paying particular attention to imbalances between developed and developing countries. Current studies suggest that non-state and subnational actions are concentrated in the global North (cf. Andonova, 2014; Bulkeley et al., 2012, 2014; Chan, 2014; Hale, Roger, & Andonova, 2013). However, climate actions have the potential to address needs in the global South (Chan & Hale, 2015), and in various respects, climate action in developing countries can be considered more urgent. The growth in GHG emissions in the global South vastly outpaces that in developed countries (e.g. from fossil fuel combustion and energy consumption; Energy Information Administration [EIA], 2015). Moreover, developing countries have the least domestic means to shoulder the costs of adaptation and mitigation, yet they are the first to face the impacts of climate change and the highest adaptation costs (Baarsch et al., 2015). Going beyond studies that analyse where activities are planned (Chan, Falkner, Goldberg, & van Asselt, 2015; Galvanizing the Groundswell of Climate Actions, 2015), this study analyses the actual geographic distribution of outputs by climate actions. A comparison between planned and actual implementation allows for a better assessment of implementation gaps across developing and developed countries.

The article draws on a large-n quantitative analysis, complemented by a survey and semi-structured interviews. The underlying database ('Global Aggregator for Climate Action' or GAFCA) contains data on organizational features, geographical patterns of implementation, and outputs of 52 climate actions.[3] The data were gathered from publicly available sources, including announcements at the 2014 UN Climate Summit, press releases, and websites and platforms maintained by individual climate actions and their partner organizations. This was complemented by a survey sent to representatives and focal points of individual actions to corroborate and augment publicly available information. A total of 25 survey responses (out of 52) were received between 24 June and 30 September 2015. In addition, comments from focal points and experts were used to contextualize the findings.

The article proceeds with a description of the 2014 UN Climate Summit and the sample of climate actions launched there (Section 2), identifying organizational features, target-setting, and participatory patterns within the sample. The third section presents an assessment of output performance. The fourth section presents an analysis of geographic patterns of implementation. The article concludes with main findings and a discussion of policy implications (Section 5).

2. The 2014 UN Climate Summit and its climate actions

The 2014 UN Climate Summit was the first UN summit dedicated to state and non-state climate action. UN Secretary Ban Ki-moon invited leaders from national governments, local governments, business, investors, civil society, and other social groups to 'galvanize and catalyze climate action', asking for 'bold announcements and actions (…) that will reduce emissions, [and] strengthen climate resilience' (http://www.un.org/climatechange/summit). While the summit was not part of the intergovernmental UNFCCC process, it aimed to mobilize political will for 'a meaningful legal agreement' at COP 21. The summit was the first in a series of attempts to align non-state and state actors outside or on the margins of the UNFCCC process. Shortly after the 2014 UN Climate Summit, successive COP presidencies have presented 70 initiatives under the 'Lima-Paris Action Agenda', and in June 2016, a 'Global Climate Action Agenda' was announced by France and Morocco (Presidents of COP 21 and COP 22, respectively), with the aim to mobilize even more initiatives (Chan et al., 2016). Arguably, large-scale mobilization of non-state and subnational actors by UN agencies and collaborating governments has substantially influenced the Paris outcome (Jacobs, 2016). However, the mobilized actions themselves also have a great potential to reduce GHG emissions, and to further enhance climate-resilient development (Hsu et al., 2015).

In total, 52 actions were launched at the 2014 UN Climate Summit. This sample is not necessarily representative of a very large and expanding universe of climate actions, but it is representative of a growing and increasingly important subset of non-state and subnational actions mobilized by UN agencies and collaborating governments. This sample features a high level of participation and leadership by the UN and other international organizations, a wide range of objectives, and a broad variety in terms of target-setting. In the following, we describe these key features.

2.1. Participation and leadership

The strong backing of UN Secretary General Ban Ki-moon helped to elicit leadership by, and action among, UN agencies (Pasztor, 2016); half of the UN Climate Summit actions are led by UN agencies and international organizations. The active role of UN and international organizations indicates an eagerness to extend their limited formal authority by mobilizing other actors to take on governance functions, playing an 'orchestrating' role, and brokering initiatives involving public and private actors (Abbott, Genschel, Snidal, & Zangl, 2015; Hale & Roger, 2014). Considering the leading role of the UN in this sample, it may not be surprising that many of the almost 1000 participants are international organizations (16%) and national government agencies (27%) (Table 1). For all the emphasis on private actors at the 2014 UN Climate Summit, participation by businesses, non-profits, and NGOs is remarkably low. Just over 10% of the almost 1000 participants in climate actions belong to the business and industry community (including for-profit firms, corporations, small- and medium-sized enterprises, state-owned enterprises, and business associations); another 10% are non-profit organizations and NGOs. When research and education organizations are included, non-state actors make up just over a quarter of all participants. If we add 'other' types of actors (15%), many of which are multi-stakeholder arrangements that are difficult to categorize (e.g. hybrid networks that are listed as single actors), the proportion is higher, but not more than about 40%. Also in terms of leadership – an important focus of the summit – the role of private actors seems smaller than one would expect. Non-profits and NGOs lead 4%, and business and industry actors 13% of climate actions.

2.2. Functional scope and target-setting

The scope of the actions launched at the UN Climate Summit is very broad. We categorized all actions, following a close examination of self-declared objectives (Figure 1).[4] Using a list of 12 functional categories, adapted from a study of non-state actions in sustainable development (Pattberg, Biermann, Chan, & Mert, 2012), we find that 'knowledge dissemination' features most prominently, followed by functions that aim at supporting and strengthening public policy, namely 'policy planning' (i.e. the production of policy plans and the development of planning and policy instruments). While most existing studies primarily focus on the mitigation potential of climate actions (Blok et al., 2012; CISL & Ecofys, 2015; Graichen et al., 2016; Roelfsema et al., 2015; UNEP, 2015), few actions launched at the UN Climate Summit carry out functions that directly relate to mitigation, such as technical 'on-the-ground' implementation (e.g. energy efficiency improvements of existing installations), or the development of low-carbon products. To be sure, climate actions that do not directly set out to achieve GHG emission reduction or adaptation could still have a significant indirect impact, for instance by influencing awareness and behaviour. However, such indirect impacts may be difficult to attribute.

Similarly, diverse patterns of target-setting suggest that climate actions aim at a wide range of objectives (Figure 2). Most quantitative targets[5] set by climate initiatives do not relate to GHG emission reductions. However, significant differences can be observed across the main action areas[6] of the UN Climate Summit. The majority of quantitative targets in the energy action area relate to mitigation. Most quantitative targets set by resilience actions relate to mobilizing and distributing funding, and agriculture actions often aim at positively affecting a certain number of people.

The multiplicity of climate actions poses challenges for a comparative assessment. For instance, by what benchmark should actions be assessed when objectives and target diverge so widely? Moreover, how can

Table 1. Participation by type of actor.

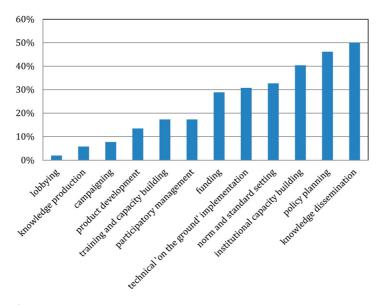|	% of participants in climate actions	% of lead partners in climate actions
National governments and agencies	27	8
International organizations	16	50
Subnational authorities	15	6
Business and industry organizations	11	13
Non-profits and NGOs	10	4
Research and educational organizations	5	6
Other	15	13

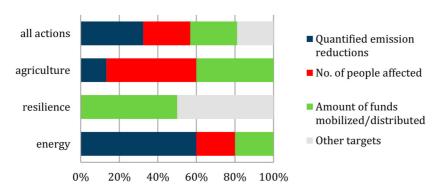**Figure 1.** Functional focus of climate actions.

Figure 2. Types of quantitative targets.

impacts be attributed when most actions relate to mitigation only in an indirect way? Two additional factors complicate a comparative assessment. First, lack of data transparency hampers an assessment of climate action (Hsu, Cheng, Weinfurter, Xu, & Yick, 2016). Currently, only 44% of actions launched at the 2014 UN Climate Summit have monitoring arrangements in place. Second, the relatively recent nature of the climate actions in our sample places limitations on the assessment. While some actions were initiated before the summit and have been operating for some years (for instance, the 'Global Fuel Economy Initiative' and the 'en.lighten initiative – Lightening Efficiency Accelerator'), the large majority (81%) of actions were launched in 2014 or later, which makes it difficult to compare actual performance across the full sample.

The next section introduces an output-based assessment method to effectively track the performance of this novel and varied set of climate actions.

3. Output analysis of performance

To overcome the limitations placed on a large-scale, comparative assessment, our appraisal of effectiveness focused on outputs, that is, tangible and attributable products of climate actions such as workshops, training manuals, scientific publications, and infrastructure. Outputs do not reveal whether problem-solving has occurred, nor do they necessarily result in desired changes. However, outputs are part of a longer chain of effects; they are a precondition for achieving other forms of effectiveness. Because outputs precede behavioural

changes and environmental impacts, an output-based assessment can be conducted earlier than other assessments. It is important to note that the functionalist logic of our assessment does not consider underlying motives behind the creation of climate actions (for possible motives, see Green, 2013; Hoffmann, 2011). However, assessing output performance remains an important first step. At a minimum, the absence of any outputs would raise questions about whether climate actions are intended to solve environmental problems.

Our analysis of output performance follows Pattberg et al. (2012), who analysed partnerships for sustainable development launched at the 2002 World Summit on Sustainable Development. The method involves an assessment of the 'function-output fit' (FOF), which measures whether climate actions produce outputs that are consistent with their main functions. A versatile performance indicator, FOF can be applied across different types of climate actions. The determination of FOF followed a three-step coding process. Throughout the coding process, we carefully defined codes within the research team, held practice coding sessions, and had subsets of actions coded by multiple coders to determine consistency and to ensure inter-coder reliability. First, we inductively created 12 main functions (see Figure 1), and for every action we attributed up to three functions (to accommodate the multifunctionality of many actions). Second, for every action we collected data on outputs – the attributable and tangible products of climate actions. We identified 26 types of output, including events, publications, norms and standards, and physical installations. In a final step, FOF is determined by indicating whether an action's production is consistent with its function. For instance, a climate action that aims to train civil society organizations could be expected to produce outputs such as curricula or training materials, or training sessions. We distinguish four FOF values: 'no output', 'output but no functional fit' (when outputs do not match functions), 'partial FOF' (when outputs match with some, but not all functions), and 'full FOF'. We assume that an action's output should be consistent with its functions to have its intended impacts. Subsequently, climate actions with a full FOF are more likely to achieve intended impacts than actions with partial or no FOF.

Using this method, we find that after just over a year[7] most climate actions produced outputs that fit some (36%) or all (29%) of their main functions (Figure 3). This finding compares favourably with historical precedents. For example, eight years after their presentation at the 2002 World Summit on Sustainable Development, 43% of partnerships for sustainable development still performed poorly, with many producing no output at all (Pattberg et al., 2012).

However, we can observe significant differences in output performance across action areas. Climate actions in the energy action area have a high score (nearly 90% full or partial FOF), while 71% of the resilience actions have yet to produce outputs. Of the agriculture actions, 33% have yet to produce outputs and 52% have produced relevant outputs. The novelty of climate action is one factor. For instance, the vast majority of agricultural and resilience actions were only launched in 2014, while two energy actions that show a high level of output performance, the 'Global Fuel Economy Initiative' and the 'en.lighten initiative', were already operational before the summit, and thus had a head start in producing outputs. But novelty does not explain the variation in output performance between resilience and agriculture actions. Moreover, the relatively high performance of energy actions may also relate to organizational capacity. The 'Africa Clean Energy Corridor' and the 'SIDS Lighthouses Initiative' benefited from being programmatically embedded in the International Renewable Energy Agency; they did not require much time to set up autonomous organizational capacity before they produced outputs.
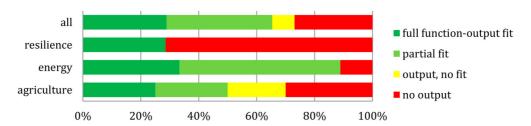

Figure 3. Output performance by climate actions one year after their launch.

A lack of output performance in a certain action area does not in itself suggest failure. Many actions may simply take longer to deliver first results. Furthermore, a lack of output performance in the short term may also indicate a high level of ambition from certain climate actions in areas where delivering outputs is difficult and takes more sustained efforts. For instance, resilience actions had hardly been recognized in international climate processes until the 2014 UN Climate Summit, and little experience exists with setting up actions in this area (Dzebo & Stripple, 2015).

4. Output analysis of geography of implementation

Most climate actions in our sample have a broad geographic focus, aimed at impacts on a global scale. A predominantly global orientation is consistent with the intention of the 2014 UN Climate Summit to catalyse climate action at a large scale. Despite having a broad geographic scope, the large majority of climate actions that are not led by international organizations are coordinated by lead partners and secretariats located in North America and Europe (75%). When most coordinating and leading partners in climate actions are based in the global North (Bulkeley et al., 2014; Hsu et al., 2015), developing country-based actors do not have the same influence to, for instance, define objectives; and benefits of climate actions may mostly accrue to advanced economies. This lack of ownership is worrying, especially when most of the future growth of GHG emissions, as well as the worst effects of climate change, are projected to take place in developing and emerging countries. Many of the 'intended nationally determined contributions' submitted by developing countries ahead of COP 21 indicated that additional means are necessary to meet mitigation and adaptation targets. Climate actions may partly meet this need if they are successfully implemented in developing countries.

This section looks at where climate actions are being implemented. Specifically, it compares 'reported countries of implementation', as declared by climate actions, and 'actual countries of implementation'. To this end, we devised a three-step strategy. First, the research team studied the announcements made at the 2014 UN Climate Summit, as well as the websites of individual climate actions, to determine the countries where climate actions plan to undertake activities. This information was widely available, as the conference organizers requested announcements to include information on where actions would take place. These data thus concern *self-reported* countries of implementation. However, it cannot be ruled out that the number of self-reported countries of implementation has been inflated. Proponents of climate actions may have been inclined to count past activities that are not part of the future commitment presented at the 2014 UN Climate Summit; activities may be planned but never realized; and impacts may be claimed that are not attributable to an individual action. Geographic patterns of implementation solely based on self-reported countries of implementation, therefore, may lead to an overestimation of the number of locations where activities are implemented.

Therefore, in a second step, we identified where outputs (also used in the analysis of output performance) by individual actions were produced. We did not include outputs that were not yet realized, making a strict distinction between what is planned and what has been realized. For every climate action, we determined the countries in which outputs were produced, by analysing documentation, websites, and social media accounts of climate actions. In doing so, we determined *actual* countries of implementation. We only specified actual countries of implementation when outputs were attributable to a certain climate action. For instance, while many cities have committed to carrying out activities under the Compact of Mayors, we only considered cities that have set up a GHG inventory and/or defined at least one reduction target since signing up to this climate action. Moreover, some outputs are not location-specific. For instance, an online information platform could benefit actors in any location with Internet access. In these cases, we recorded the country of implementation as (1) the country where such an activity was launched and (2) the location of the implementing partner (in that order). In a third and final step, we compared aggregate data on *self-reported* countries of implementation, with data on *actual* countries of implementation, to reveal any implementation gap between planned and actual implementation across countries in different income groups, as defined by World Bank classification (World Bank, 2016).
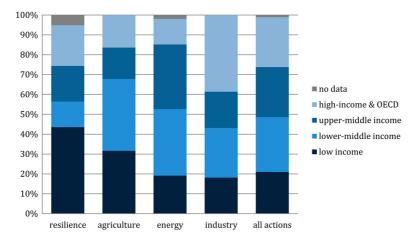
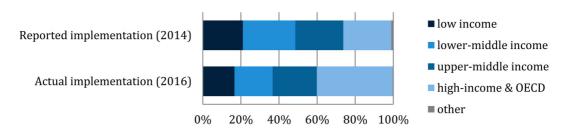**Figure 4.** Implementation contexts by action area.

Figure 5. Reported and actual countries of implementation.

Using this method, we find a relatively balanced distribution of self-reported countries of implementation. Low-income and lower-middle-income economies account for nearly half of the reported countries of implementation, with upper-middle-income economies and high-income countries accounting for 25% each. Actions also target specific types of countries according to different needs and capacities: resilience and agriculture actions are predominantly implemented in low-income and lower-middle economies, while most industry (mitigation) commitments focus on high-income or upper-middle-income economies (Figure 4).

Where climate actions *plan* to implement across developing and developed countries in a reasonably balanced manner, actual implementation patterns suggest a stark imbalance: of the total number of locations where outputs were produced, 40% were in high-income and OECD countries, only 17% of the locations were in low-income countries, and 20% were in lower-middle-income countries (Figure 5). If we compare reported and actual countries of implementation, the share of low- and lower-middle-income countries is much lower in the latter. A possible explanation is that actions initially respond to needs in developing countries, but subsequently run into problems or decide to implement in developed countries instead.

Current studies (Chan, Falkner, et al., 2015; Pattberg et al., 2012) and data platforms (such as NAZCA and UNEP's Climate Initiatives Platform) already indicate a lower number of non-state actions in developing countries. Our analysis suggests that the level of activity by non-state actions in developing countries is even lower if we take the production of outputs into account.

5. Conclusion and discussion

The 2014 UN Climate Summit was a milestone on the way to COP 21, not least because it built political momentum and contributed to the creation of a positive 'can-do' narrative (Jacobs, 2016). The launch of 52 actions at the summit, involving almost 1000 stakeholders, demonstrated that a growing number of actors are willing to

take action on climate change. This article provides a first comprehensive analysis of these actions, with a focus on developing a better understanding of their output performance and their implementation across developed and developing countries. The analysis in this article leads to two main findings.

First, after just over one year, most climate actions have produced outputs that fit some or all of their main functions. While this is an encouraging finding, output performance as such does not guarantee problem-solving and environmental or behavioural impacts. More attention needs to be paid to high mitigation potential initiatives, such as the Global Investor Statement on Climate Change, the Aviation Action Statement, and the New York Declaration on Forests. Statements and declarations may be an interesting political output, but with little follow-up, they are unlikely to realize their potential in terms of raising funds, setting standards, or reducing GHG emissions. Moreover, output performance varies considerably between the summit's action areas. Resilience actions, in particular, show a low level of output performance, while energy actions seem much more effective. This may relate to the fact that resilience actions were only launched in 2014, while some energy actions benefited from existing operations, or programmatic embedding in existing organizations.

These findings raise questions that should be addressed in subsequent research. For instance, do resilience actions simply need more time, or do they need to overcome more hurdles? Are relatively well-performing actions simply repackaged, pre-existing initiatives, or have they been enhanced in the context of the 2014 UN Climate Summit? A more fundamental question relates to the factors that influence the effectiveness of climate actions. While this question lies beyond the scope of this study, previous research has associated higher levels of performance with financial resources and organizational capacity (Chan & Pauw, 2014; Galvanizing the Groundswell of Climate Actions, 2015; Widerberg & Pattberg, 2014). Our database, although limited by the scarcity of publicly available information, offers a few insights. First, climate actions may be hampered by underfunding. Of the 14 climate actions in our sample that aim at providing or raising funds, only 4 have actually managed to raise or distribute funds, raising questions about whether the broader sample of actions will have sufficient financial capacity. While greater capitalization can still be expected, persistent underfunding has proven to be problematic in the past for many non-state actions. For instance, 65% of partnerships for sustainable development were still looking for funding four years after their launch at the 2002 World Summit on Sustainable Development (Biermann, Chan, Mert, & Pattberg, 2007). Second, over half of the climate actions lack dedicated staff and/or a secretariat. For a few actions that are programmatically embedded in larger organizational structures and networks, this may not be a problem; in other cases, climate actions may simply lack the capacity to deliver on their promises.

Second, the article looked at where initiatives intended to implement their actions, and where they actually implemented them. This study not only confirms North–South gaps in participation and leadership, but it also suggests that the implementation gap in low-income and lower-middle-income countries is much wider than that in high-income and OECD countries. While climate actions initially distributed their operations in a reasonably balanced manner across developing and developed countries, they seemed to run into greater problems once they implement in developing countries. More research is necessary to understand why the implementation gap is wider in developing countries, and more efforts are necessary to support implementation in developing countries.

Finally, our analysis leads to some policy suggestions. There is a growing trend of UN and internationally led efforts to align transnational governance with global public goals (Abbott et al., 2015; Abbott & Snidal, 2010; Chan, van Asselt, et al., 2015; Hale, 2016; Hale & Roger, 2014). The 2014 UN Climate Summit was the first large-scale attempt to link non-state actors with the international climate regime. Moreover, an increasing number of initiatives by governments and international organizations recognize the potential non-state actions. Efforts to realize synergies between the intergovernmental and transnational spheres of global climate governance are especially opportune ahead of the 2018 facilitative dialogue, in which parties will take stock of collective efforts towards the long-term climate goals, with a view to informing nationally determined contributions. In this context, climate actions could demonstrate solutions and inspire higher national ambitions. The COP 21 decision builds on an action agenda which partly finds its origin in the 2014 UN Climate Summit, by designating 'high-level champions' representing successive COP presidencies with overlapping terms, to ensure better coordination and mobilization of an action-oriented agenda until 2020. Our

research suggests that the post-Paris 'Global Climate Action Agenda' could step up efforts to mobilize non-state and subnational actors by addressing the following:

- The Global Climate Action Agenda should address the implementation gap of climate actions in developing countries. Most efforts to orchestrate climate actions and demonstrate solutions happen at large international meetings, mostly in developed countries. To better facilitate climate action in the global South, efforts should also focus on non-state actors in certain countries and regions. For instance, at international climate conferences, much emphasis is placed on climate actions by larger multinational corporations. However, very few of them are based in developing countries; a focus on small- and medium-sized enterprises may be more promising in these regional and national developing country contexts.
- The Global Climate Action Agenda should promote greater data transparency of climate actions, especially those featured in the NAZCA platform and in the UNFCCC process, to allow a better understanding of their effectiveness, and their contributions over time. In the context of the UNFCCC, climate actions are often highlighted as practical solutions, and good practices. However, valuable lessons can also be learned from the failure of certain actions. A better understanding of factors underlying effectiveness is necessary to improve climate actions. For instance, climate actions in the resilience action areas appear to be underperforming. If the international community continues to focus on this action area, efforts are necessary to better understand and improve them.
- Although the 2014 UN Climate Summit succeeded in engaging many stakeholders, participation by private sector actors (business and NGOs) remains rather low. The Global Climate Action Agenda should find more effective ways to incentivize private actors to engage in climate actions.

Notes

1. This article uses 'non-state' to denote a wide variety of actors that are not Party to the UNFCCC, including civil society organizations, businesses, investors, cities, and regions – both individually and in cooperation with each other and with government authorities.
2. Hsu et al. (2015), investigating the same sample of climate actions, primarily focused on a smaller subset of actions that mainly addresses mitigation.
3. Based on the 29 'action statements' and 'commitments' that were presented at the 2014 UN Climate Summit, we identified 52 individual climate actions.
4. To accommodate the multifunctional character of these actions, up to three of their most important functions were coded.
5. Just over half of all actions (54%) have set quantified targets. Well-defined targets have been associated with effectiveness; they communicate a clear purpose and make it easier to track progress towards meeting them (e.g. Beisheim & Liese, 2014; Pattberg & Widerberg, 2014). While it is encouraging that many actions set quantitative targets, it is important to recognize that it is difficult to define such targets for many types of climate actions. Measurable targets are particularly difficult to set for 'softer' functional objectives, for instance, the dissemination of information.
6. The classification into 'action areas' follows the categories as defined by the organizers of the UN Climate Summit: agriculture, cities, energy, financing, forests, industry, resilience, and transport. Our comparison between action areas focused on those with most actions: energy, resilience, and agriculture.
7. Data on outputs in the database were updated until October 2015; the database was last updated in February 2016 to include data on actual countries of implementation.

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Disclosure statement

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