



The Way Forward in
International Climate Policy:
Key Issues and New Ideas 2014

Edited by: Heleen de Coninck, Richard Lorch and Ambuj D. Sagar

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Preface

With only 16 months left to negotiate a global climate agreement in Paris in 2015, there is still much work to be done. CDKN recognises that building the conditions for an ambitious, inclusive global climate deal requires efforts on many fronts. As part of this effort, CDKN has supported progressive thinkers from different disciplines and sectors to bring together their expertise, experience and innovative thinking to stimulate the dialogue.

In May 2014, CDKN and Climate Strategies convened leading climate change academics, policy-advisors and subject matter experts to address some of the critical deadlocks hampering climate negotiations, and to identify new economic, social and political ideas to move the debate forward. This publication presents some of the ideas discussed during the event, the Global Climate Policy Conference. These range from the creation of climate 'club goods' to the role of green investment vehicles, technology and innovation in supporting mitigation and adaptation activities. This report also explores the social psychology of messaging and how this applies to our communications with the public and the private sector; and considers how personally held concepts of justice and equity might influence negotiations on adaptation, mitigation and loss and damage.

As a community of policy-advisors, researchers, and practitioners we can move the debate forward, but to do this, we need to make better efforts to link policy back to the research and make that visible nationally and in international negotiations. Events like the Global Climate Policy Conference provide an important space for such a dialogue, and we hope this publication offers some fresh insight on some of the issues that have been stymieing progress on tackling climate change. While CDKN and Climate Strategies do not necessarily endorse the opinions shared here, we are happy to provide a platform for the exchange of views. We encourage readers to visit us online (www.cdkn.org and www.climatestrategies.org) where readers can leave comments on the papers collected here.

Sam Bickersteth
Chief Executive, CDKN

Editorial: What next? Exploring ways forward in the climate arena

Heleen de Coninck¹ and Ambuj D. Sagar²

Even as the United Nations Secretary General convenes a Climate Change summit in September 2014, and the world prepares for what hopefully will be major step forward in the UNFCCC meeting in Paris in 2015, it is clear that the urgency remains for further collective ambition and large-scale action to prevent dangerous anthropogenic interference with the climate system. The good news from the Working Group III contribution to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report is that it is still possible to limit climate change to 2°C. The bad news, however, is that current action is inadequate for such a target. Moreover, the assessment of the literature in the international policy chapter of this IPCC report provides few new insights on how global climate policy can help find a way out of the current impasse over more stringent climate action (in mitigation and adaptation).

The following collection of papers is intended to highlight specific opportunities, thinking frames and directions that could help move us towards climate-compatible, sustainable and equitable development. The ideas and approaches outlined in these papers were presented and discussed at the Global Climate Policy Conference in London in May 2014. The ensuing feedback was then incorporated into these papers. The aim of this event was to bring together climate researchers, original thinkers and negotiators to discuss and deliberate on new potential approaches that might catalyse action within and outside the UN negotiations. These new ideas could help to address the climate problem in a fair and effective manner, while being as efficient as possible. Therefore, these purposely are not traditional academic papers nor fully polished proposals but explorations of potentially fruitful innovative solutions and approaches.³

As scholars have proposed and argued in the past, the days of a single-issue climate treaty may be numbered. Climate change is just one junction in a complicated web of interwoven issues related to development, green growth, sustainability, equity and justice, trade, institutional structures, technology, investments and finance, innovation and competitiveness, to name but a few. Our hope is that these elements, as discussed in this publication, will tell a story that will make a difference in addressing climate change.

Much research suggests that economic and ecological aims can co-exist, and even reinforce each other. However, political tensions persist between economic growth and development on the one hand, and environmental sustainability on the other. For decades, the term 'sustainable development' has united the global community in its search for answers to these tensions, and it remains the predominant goal for development. Recently, however, 'green growth' seems to have emerged as a formulation that has greater political acceptability. Carlo Jaeger, in his paper, explores whether green growth could provide a new narrative for climate action and more. Although evidence that the concept of green growth can help advance climate resilience is still needed, many are suggesting that climate change mitigation and adaptation may need to be seen as being intimately interlinked with national green growth strategies, rather than the current approaches that often view targets and agreements in isolation. The concept of 'climate compatible development' can be seen as an important element of inclusive green growth. Although a healthy sceptical attitude towards this new approach may be warranted, Jaeger argues that it could also be seen as one way to explore possible ways to frame and organise climate action. This is a key step in accepting and embracing the complexity of climate policy.

The central importance of addressing fairness, equity and ethical issues was highlighted by the IPCC climate change mitigation and adaptation reports. However, how these concepts might be interpreted and implemented in practical terms is largely left open. It is challenging but necessary to make the connection between the concepts around equity and the practicalities of action on the ground. The framing of ethics and equity is another of the junctions in the web of connections in which climate change resides. Sonja Klinsky draws upon social psychology to suggest how issues of equity may be re-framed and approached in a more positive manner by, for example, avoiding a zero-sum perspective and by being more sensitive to how others perceive fairness. She provides insights for a constructive equity discussion by linking the 'backward-looking

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³ These papers were selected from submissions in response to an open call for proposals from researchers and practitioners that outlined innovative ideas that could advance climate action. Therefore, the collection of topics emerged in a bottom-up way and does not cover the full scope of climate action and spectrum of ideas, while still providing an interesting set of framings of the climate problem and potential solutions.

justice, forward-looking peace' approach in peace and reconciliation processes to the climate negotiations, in particular the contentious issue of historical responsibility. The debate on this paper at the Global Climate Policy Conference was lively, and emphasised the need to look at equity from the perspectives of many different stakeholders, as well as the probability that changing these perceptions could be a slow and gradual process.

'Common but differentiated responsibilities' (CBDR), in combination with capabilities, is one of the key principles of the UNFCCC and, accordingly, also a central element of fairness and equity discussions, with legal implications for obligations under the Convention. There is wide agreement that addressing climate change, both through adaptation and mitigation, requires huge investments, but can potentially also yield enormous benefits. Who should bear the burden of these investments and who will reap the benefits? How do we deal with the costs in the absence of adequate climate action? These questions go to the heart of the climate debate. Their resolution is contingent not only on the distribution of responsibility and capabilities, but also the distributional effects of climate action (and inaction). Drawing on the International Law Association's (draft) articles with commentaries, Christoph Schwarte considers how the legal principles embedded in the UNFCCC, particularly CBDR, can be interpreted and implemented under the Climate Convention. Xiaohua Zhang and Yue Qi explore CBDR with a more direct approach, entailing a refinement of the non-Annex 1 grouping. They argue that a more nuanced view of capabilities within the non-Annex 1 grouping could help refine the CBDR concept. This would create enhanced engagement from various Parties and help translate the Principle into concrete implementation. But some participants in the Global Climate Policy Conference debate cautioned that the 40-year history of CBDR could not be set aside lightly, while others questioned how CBDR should be treated in a landscape of pledges and national commitments, rather than binding international law.

In response to this increasingly complicated and interlinked set of issues, institutional structures may need to be modified too. Insights from the institutional economics, business administration and change management literature show that change in one leap is unlikely to succeed – whether this is change to a culture, or the introduction of new technologies or new practices for an entire organisation. A better strategy is to start with the early adopters, who are willing to take risks and who will improve the agreement. The laggards can then be enticed by the frontrunners' positive experiences. Single-issue, single-technology or single-sector coalitions of the willing (or clubs) may bring back some of the optimism that agreements can work, and may provide a basis for an agreement that has a wider scope. These efforts should be seen as experiments from which one must learn. This will inform and improve future policy-making (which is an essential ingredient of dealing with complexity, to harken back to Jaeger's point).

The final set of articles presents a range of perspectives on how to engage in policy or organisational experimentation to advance climate actions. Thomas Brewer discusses the feasibility of 'club goods' as an approach that might bring like-minded actors together to engage in climate-positive activities. Based on the example of international maritime shipping, some wider considerations are drawn for creating appropriate conditions and outcomes for a 'club'. As a more ambitious approach, Jose Alberti Garibaldi elaborates on the concept of the Quisqueya Platform. This idea is meant to offer a space that promotes and facilitates early action in developing countries and creates local synergies between mitigation and adaptation as a way to catalyse broader forward movement in the climate arena. But engaging in these kinds of mitigation and adaptation activities often requires funds for infrastructure development or modification. Christa Clapp explores a way to raise such funds: green bonds are an emerging and promising way to raise climate finance from the private sector. She notes that while the potential of green bonds is enormous, much hard work in building investor confidence through the setting of benchmarks and then assessment will be required. The Global Climate Policy Conference discussion suggested that the background of increasing company disclosure of climate risks and the first signs of divestment from high-carbon stocks could be helpful. Perhaps the most ambitious approach is outlined by Carlos Rossi. He proposes building large-scale public-private partnerships to help developing countries adapt and implement climate technologies. This approach would underpin and accelerate their mitigation and adaptation activities.

Creative thinking and ideas about possible solutions are desperately needed to overcome the climate negotiations/action impasse, along with greater engagement of the research and analysis community with the world of practical action. These papers and the discussions from the conference are a useful and positive contribution to presenting innovative thoughts and ideas to catalyse new thinking in both the academic and policy communities. In doing so, we hope this will contribute to dealing with the complexity of the climate issue and make a contribution to the path towards climate-compatible, sustainable and equitable development.

Green growth and climate policy

Carlo Jaeger¹

Abstract

The Copenhagen climate conference signalled the state of near-paralysis reached by global climate policy. There are some encouraging signs in view of the 2015 Paris conference, but if they are to be developed further then a serious rethink of the conventional framing of climate policy is needed. The limitations of the two most influential narratives for climate policy are explained: the tale of pending catastrophe and the one of finding a single optimal policy. An alternative, more positive narrative is proposed that offers a constructive way forward. Sustainable development can be made more operational through the concept of green growth. In this perspective, global climate policy ceases to be 'mission impossible' and becomes a global coordination problem that can be solved by patiently pursuing win-win options. The danger that green growth rhetoric will become just another form of greenwashing is discussed along with the long-term future of a world beyond economic growth. The possibility of overcoming the impasse of global climate policy is explored through the creation of green growth clubs.

The 2°C line

Decades ago, one of the most influential scholars in the climate policy debate, Bill Nordhaus, drew a line at 2°C in a diagram of change in global mean temperature (Nordhaus, 1977: 3).² He called the line 'Estimated maximum experienced over the last 100,000 years' and suggested that it would be reasonable to keep global mean temperature below that level. Nordhaus did not think that decades later the Conference of the Parties to the UNFCCC would end with a document 'recognizing the scientific view that the increase in global temperature should be below 2°C' (UNFCCC, 2010: 5). Nor could he imagine that similar statements would be issued by various national governments, the European Union (EU), the Group of Eight (G8) and the Major Economies Forum, which included Brazil, Russia, India and China.

These statements may look innocuous at first. But recent research has translated the 2°C number into tonnes of CO₂ (Matthews et al., 2009; Meinshausen et al., 2009). The results suggest that the 2°C line requires humankind to reduce global emissions by more than 2% per year starting right now. If global emissions would start to decline in 2030 (still a rather far-fetched assumption), then annual reductions would need to be closer to 10% per year. And if global emissions peak in 2040, staying below the 2°C line seems already ruled out.

Global climate policy finds itself in a bind: it seems to require a 'mission impossible' from nations that have a hard time to reach agreement on joint action, but struggle with all sorts of further problems. Under these circumstances, an urgent to re-examination is needed of the framing of climate policy with a critical look at new ideas (Jaeger et al., 2012).

Narratives of burden sharing

There are two stories that can be told to justify the view that global climate policy should keep the climate system within a well-defined boundary like the 2°C line.

First, there may be a tipping point of the climate system such that beyond 2°C of global warming catastrophe looms. One might argue that beyond this threshold large ice masses, say the Himalaya glaciers or the Greenland ice shield, would melt, or that the Amazonian rain forest would disappear, or that hurricanes on the coast of China would become much more likely, or many of these things would happen in combination. To avoid future climate catastrophe, then, humankind must accept losses of welfare in the present.

However, while there may be myriads of tipping points for all sorts of beings affected by climate change, there is simply no evidence of any broad threshold, be it at 2°C or 1°C or any other level. It is indeed remarkable that the thousands of pages produced by IPCC do not contain any result to that effect.

The second story to justify a threshold like 2°C has been pioneered by Nordhaus himself, although it eventually led him to a different number. In this narrative, there is no singular tipping point, but there are damages that increase with global warming. The benefits of climate policy are the damages avoided. On the

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² For background and a comprehensive assessment of the 2°C threshold see Jaeger and Jaeger, 2010.

other hand, avoiding such warming generates costs. The less warming one wants to accept, the higher these costs. Therefore, global climate policy should aim at the degree of global warming where the benefits exceed the costs by the greatest amount. This is the cost-benefit analysis that has come to dominate a large part of climate politics. According to Nordhaus (2008: 82-83 and 107) this leads to an optimal level of warming at about 3.5°C, to be reached around the year 2200.

The climate problem is fraught with 'deep uncertainty'. This makes it all but impossible to produce quantitative estimates of the benefits of climate policy (Pindyck, 2013). Things do not look better for the estimates of the costs of climate policy.

Moreover, as long as most nations believe that global climate policy has a net cost, at least over the coming years and even decades, they will have a strong tendency to try to shed as much of that cost as possible onto others. The result is the observed stalemate in climate policy. More than three decades of climate policy show quite clearly that narratives of present costs and future benefits of climate policy simply don't generate the political will for serious emissions reductions.

Green growth narrative

Suppose that some nations develop climate policies that yield not only a long-term net benefit, but also short-term gains. Their example might well overcome the paralysis of global climate policy. This is the hope raised by proponents of green growth such as the OECD (2011) and the World Bank (2012).

Green growth talk was initiated by the Republic of Korea, based on discussions at the World Economic Forum in 2001 (Park, 2013: 208). A wide range of countries – Ethiopia, Indonesia, Kazakhstan, Mexico and more – have since formulated green growth strategies. The European Green Growth Group involves ministers from 13 member states. In collaboration with the World Bank, China has formulated an impressive green growth strategy (World Bank and DRC, 2012). The green growth narrative is an attempt to elaborate the general idea of sustainable development. It proposes a future where economic, environmental and social goals can be pursued without hurting each other.

If this pleasant picture is taken at face value, then the 2°C line acquires a very different meaning. Setting an overarching goal for global climate policy ceases to be an attempt to impose a scientifically justified target and becomes an exercise in solving global coordination problems by pursuing win-win options.

So far, however, no country has credibly delivered on policies that would lead to an environmentally friendly and socially inclusive new growth path. Germany came close in the two decades after re-unification, when it increased its gross domestic product (GDP) by a quarter while reducing greenhouse gas (GHG) emissions by a quarter. But growth slowed down, social inequality increased and, in recent years, emissions increased again, so a conclusion has yet to be reached. Of course, many countries have achieved important successes in environmental protection, often by explicit policies, sometimes by chance. Yet there is a danger that talk of green growth will end as a rather shallow public relations exercise and will have no impact upon the current patterns of economic growth that will lead to a significantly warmer climate by 2100.

Given the dearth of evidence of successful green growth, one should not discard easily the argument that environmental and social goals would be better served by phasing out economic growth altogether (Jackson, 2009). However, this argument will only have credibility when developing countries have overcome poverty.

This possibility of green growth may well be realised. Over the past two centuries, in the countries leading global economic growth – first the United Kingdom (UK), then the United States (US) – GDP per capita has grown at a rate of about 2% per year, with other countries catching up (Lucas, 2000). The convergence began slowly and involved only a few countries, but currently – very much led by China – it is happening at truly spectacular rates and involves billions of people.

Global climate policy, however, must operate in a world where highly industrialised countries will keep growing at rates between 1% and 3%, while an increasing number of other countries will grow at much higher rates, until their development converges with development in countries which started their economic growth earlier. If growth of that kind is a given, can it be green?

Embracing complexity

The world of global climate policy is much more complex than any single model or theory could capture (Grubb, 2014). In this complexity lies a crucial opportunity: it is possible to unblock global climate policy by creating the space for green business models to evolve, to create growing networks and synergies – ecosystems of business – until effective breakthroughs can be achieved. For this purpose, it is essential to reshape the climate policy arena so as to embed nation states in a truly transnational regime (Abbott, 2014; Stewart et al., 2013). The following steps outlined below may help.

Consolidating the 2°C narrative

The Conference of the Parties, as well as other political bodies, must continue to communicate clearly that they see anthropogenic climate change as involving huge risks and uncertainties for future generations. They need to further reinforce their commitment to limit global warming to 2°C by 2100. They should make it clear that this is a pragmatic decision in the face of deep uncertainty, and that they will review, and possibly modify this limit, in the light of future knowledge in 2030 and again in 2050. In a world characterised by large-scale underemployment, they must also emphasise that the investments and innovations required for the transition to a low-carbon economy should foster green, inclusive growth to help to overcome global poverty. Finally, they need to clearly communicate that if we do not massively reduce global emissions in the coming decades, then respecting the 2°C limit will require costly measures of CO₂ capture later on (Cao and Caldeira, 2010).

Strengthening pledge and review mechanisms

In the coming decades, the US and China (as well as other nations) will need to cautiously redefine their relations and their roles in the society of nations. International organisations will be essential in this process, but it will not happen by either of them surrendering national sovereignty to such organisations. In such a setting, the philosophy of pledge and review, with all its shortcomings, becomes essential for global climate policy (Buhr et al., 2014). The tension between the requirements of a 2°C limit and the perspectives implied by current pledges for emissions reduction must be acknowledged and used to gradually pull the fabric of those pledges towards actual emissions reductions at a global scale. For this purpose, national pledges are necessary, but insufficient. There is a need for transnational mechanisms fostering emissions reductions.

Establishing green growth clubs

The Conference of the Parties, as well as other political bodies, defines a formal status for transnational clusters of heterogeneous agents (governments, businesses, trade unions, NGOs, universities etc.) jointly pursuing a non-climate goal in such a way as to reduce GHG emissions: green growth clubs. Their focal points may differ widely in terms of products and services: from developing new forms of energy storage to new forms of internet-supported education, from building large-scale dams to addressing the air pollution from coal, from new business models in transport to preparing for heatwaves, etc. Some are sectoral in scope, others regional, still others are based on linkages cutting across sectors and regions.

Green growth clubs are recognised in the setting of the UNFCCC by a standardised procedure that makes them eligible for support by the Green Climate Fund and involves them in the UNFCCC reporting system. More broadly, they become an essential element in the pledge and review mechanisms of global climate policy. A first set of green growth clubs will be established at COP 21 in 2015. The following are three possible examples.

Green cities

Existing networks of cities oriented towards sustainable development (possibly enlarged so as to include businesses, NGOs, universities etc.) can qualify as a green growth club by explicitly combining non-climate goals with a reporting scheme on GHG emissions reduction. The club is stabilised by non-climate goals, which may include reductions in air pollution, congestion and crime, as well as the enhancement of the quality of life and prosperity. From the point of view of the club, GHG emissions reduction is a co-benefit that links the club to UNFCCC and to other green growth clubs.

Financing for sustainability

The United Nations Environment Programme (UNEP) finance initiative could join forces with selected governments and possibly the International Monetary Fund (IMF) to develop financial instruments to mobilise idle financial resources for productive investment. They could include green infrastructure bonds along the lines proposed by Diekmann (2014), stepwise expand the role of special drawing rights in financing the transition to a low-carbon economy, building on suggestions by Zhou (2009), or complement micro-insurance with macro-insurance for very large risks as discussed by Shiller (1993).

Sustainability skills

A group of governments, industrial associations, trade unions and educational institutions could develop a programme for vocational skills with the perspective of sustainable development. This could be based on a combination of massive open online courses with face-to-face learning, of the kind used in vocational education in German-speaking and Scandinavian countries. The programme would lead to a number of broadly defined vocational certificates in fields like information technology, construction work, clerical services, biotechnology, etc.

Taken together, these steps can facilitate the transition to a low-carbon economy, but they cannot guarantee its success. Many things can and will go wrong in tackling climate challenge. The only way to avoid mistakes, as far as possible, and to learn from them when they happen is to nurture an ongoing critical debate about global climate policy. As Flyvbjerg (2014: 15) remarks about the time when the management of megaprojects was carried out in utter naivety:

‘It was not common to talk openly about overruns, fraud, and abuse in relation to megaprojects, although they were as widespread then as now. The few who did so were ostracized; however, as emphasized by Wittgenstein (2009), we cannot solve problems we cannot talk about. So talking is the first step.’

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Towards constructive fairness: applying the social-psychology of fairness to climate policy

Sonja Klinsky¹

Abstract

Lessons from the social-psychology of fairness could contribute to a more constructive climate policy. It is argued that such an approach could help find a path between self-interested positions and principle-based equity frameworks, both of which can lead to policy failure and/or political stalemate. Participants' ideas about the contours of relationships and causality in a situation actually shape which concepts of fairness are likely to be used and accepted by those involved. Several insights are harnessed to explore three concrete areas in which an appreciation of the social-psychology of fairness could be useful: the use of equity rhetoric; the creation of climate policy narratives; the balance between backwards-looking justice and forwards-looking transformation.

Introduction

There are few experiences as visceral as the feeling that something is unfair in a fundamental way. Equity debates within the climate change policy arena are not immune from this: one cannot engage with global or domestic climate policy debates without running into strong emotions and deeply held convictions about what is or is not fair, and why.

Interestingly, despite the profoundly psychological nature of the issue, very little attention has been paid to the social-psychology of fairness within the climate change policy arena. The concept of fairness in climate policy is explored with relevant insights from the social-psychology of fairness: the use of equity rhetoric; the creation of climate policy narratives; the balance between backwards-looking justice and forwards-looking peace.

Why fairness is essential in climate policy

Climate change necessarily imposes a tension between a shared collective imperative for action and recognition of the differentiated capacities, needs and emission patterns across nations. These tensions are long standing (United Nations General Assembly, 1990), and are central to the current efforts to use the Durban Platform to drive a 2015 agreement (UNFCCC, 2011).

Recognising the tension between collectivity and differentiation, many efforts² have been made to define a burden-sharing agreement built around principle-based ideas of justice. This work pointedly reminds the global community that an adequate response to climate change is a moral issue and encourages nations to look beyond immediate economic self-interest.

One specific challenge to a principle-based approach is that international treaties require domestic ratification. Agreements that do not feel fair to domestic publics are unlikely to be politically acceptable and will not be implemented regardless of principle-based requirements for justice in the climate space.

It is in the space between principle-based but difficult to operationalise ideas of climate equity, and 'anything goes' self-interested contributions, that the concept of fairness may be of most use. Fundamentally, a global agreement has to be 'fair enough' to all Parties facing incredibly diverse opportunities and challenges in order for them to *adopt* it internationally, and *implement* actions domestically. Recognising the role of fairness in this political context makes the understanding of the social-psychology of fairness a potentially useful lens for climate policy analysis. Why, and when, do people accept certain arrangements as 'fair'?

Social-psychology of fairness

Relationships and perceived distance

One of the over-riding insights about fairness from social-psychology is that fairness judgements are profoundly social, which means that resolving them involves looking beyond the immediate disputes to the broader social context. Three observations are specifically useful in this regard:

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² See for example: Agarwala, 2010; Baer et al., 2009; Chakravarty et al., 2009; Tonn, 2003.

- Humans routinely differentiate between in-group and out-group members when making and using fairness arguments (Mullen et al., 1992).
- Our ideas of who is included or excluded from our scope of consideration are mediated by ideas of conflict, utility and similarity (Opatow, 1990).
- Humans do not have a single notion of fairness. Instead, we may use different frameworks for justice depending on the overarching goals of relationships and specific situations (Deutsch, 1975; Fiske and Tetlock, 1997).

In the climate context, these insights suggest that issues such as perceived competition, limited 'utility', and dissimilarity could erode the resonance of fairness claims when made across distances of various types. Similarly, how do different parties understand the contours of the global community? Is understanding it primarily dominated by concerns about economic competitiveness, or are there elements of concern about ensuring some level of human wellbeing, or protecting the most vulnerable?

Parties' ideas of fairness are likely to be rooted in geopolitical and economic desires and concerns, historical narratives, and experiences of both interdependence with and independence from others. While these may be 'fuzzier' than climate policy specifically, failing to consider them could undermine parties' abilities to understand the fairness perceptions of others.

Causality

The social-psychology of causality and fairness is another area of particular relevance to climate policy. Four key insights emerge from this body of work:

- People are more likely to feel an obligation to 'clean up their own mess' than to contribute positively to a situation to which they have not negatively contributed (Baron, 2006).
- The extent to which people feel causally responsible is linked to the length and complexity of the causal chain.³
- Perceptions of causality are often mediated by ideas of intentionality and control.⁴
- Perceived causality shapes the responses that parties may feel are appropriate after an injustice has occurred.⁵

From a fairness perspective, these insights suggest that it could be useful to recognise different kinds of causal claims in the climate change context. For instance, the causal chain involved in mitigation is relatively short, and emissions can be measured, and to some extent are emitted 'on purpose' and controlled. In adaptation, or loss and damage, the causal nature of the argument is much less linear, has more intervening factors, and is not intentional or controllable in the same way.

Exploratory research confirms this hypothesis: public participants were seen to place much less emphasis on causation as a fairness argument for the allocation of adaptation responsibility than for mitigation responsibilities (Klinsky et al., 2012).

Strategies for constructive climate policy

Bounded equity rhetoric

One lesson from a social-psychological perspective is that at least two important conditions need to be met for claims about (un)fairness to contribute positively to resolution:

³ Direct causal actions are regularly seen as 'more bad' than actions with similar outcomes that are mediated by several steps (Waldmann and Dieterich, 2007; Greene et al., 2009).

⁴ Harms that are seen as accidental are consistently judged less severely than those perceived as intentional and fully within the control of the perpetrator (Shaver, 1985). The judgment also applies to actions that were not entirely within the control of the person triggering the chain of events that led to the harm.

⁵ For example, accidental harms may be settled through some form of amelioration or compensation, but victims of those seen as more intentional, with more control, or more direct causality, may only be satisfied with some form of retribution or active punishment of the perpetrators (Darley and Pittman, 2003).

- Parties must have some degree of mutual recognition as belonging within each other's scope of moral consideration.
- Fairness claims need to be used with care. If one party feels the other is using fairness rhetoric only for tactical purposes, justice disputes may deepen (Mikula and Wenzel, 2000).

Appeals to equity, or the use of equity language to communicate perceived fairness, will only work if they respect the perceptions of the other parties in the conversation: *ignoring how others subjectively perceive the dimensions of fairness could escalate – not resolve – disagreements.*

Particular care is needed when using causality as a key argument about fair action. The resonance of causal claims depends on its directness and the extent to which harms are intentional and controllable. Key elements of climate change negotiations – including mitigation, adaptation, and loss and damage – differ on these elements. While strong causal arguments in some areas, such as mitigation, may resonate fairly broadly, this is unlikely to be the case for more complex and indirect areas like adaptation.

The danger is that when combined with existing interests, either *strong use of causal argumentation*, or *strong rejections of it* in areas in which causality is complex and murky, could be interpreted as merely 'tactical', and thus make conflict worse. This logic also suggests that different levels of 'responsibility' may need to be negotiated across different aspects of climate change: *one version of equity is unlikely to be suitable for all.*

Changing narratives of climate policy

Insights from the social-psychology of justice also lend support to arguments for the necessity of shifting the narrative of climate policy away from a zero-sum, competitive burden-sharing framework. As seen above, we are least likely to consider others' justice claims when we are in a competitive situation. If genuine engagement with the perceived fairness of others is essential for creative resolution, then continual framing of the climate change problem as a competitive burden-sharing dilemma may diminish the social-psychological resources most required for resolution.

While beyond the scope of this paper, there is a range of research that is exploring the potential for positive-sum, benefit-oriented approaches to climate policy and development.

For example, efforts to explicitly include the damages of climate change into policy evaluations could shift domestic mitigation action from a cost, into a potential benefit (Stern, 2006; Garibaldi, 2014). Similarly, others have suggested that a new model of economic growth is possible – one that is less dependent on the use of fossil fuels, that takes catastrophic losses into account, and that might provide greater domestic wellbeing than the current structure (Jaeger, 2012; Zhang and Shi, 2014). To the extent that these evaluations change the concept of costs, both approaches could reduce the collective action zero-sum orientation of current negotiations.

Recognising how the social-psychology of fairness intersects with perceived costs and benefits highlights the importance of the narratives used to structure policy formation and analysis. If we want to find constructive resolutions to the climate policy problem, then we may need to conduct policy analysis that reflects the true costs and opportunities of mitigation and adaptation action. As it stands, a cost-oriented, competitive, burden-sharing framing of policy choices is almost perfectly designed to engender psychological and political *resistance* to constructive action.

Balancing backwards-looking justice and forwards-looking transformation

Historical responsibility remains a highly contentious equity issue. Fundamentally different – and possibly irreconcilable – perspectives currently exist in terms of the importance placed on using historical emissions directly to determine emissions reduction effort.

Peace and reconciliation processes (Avruch and Vejarano, 2002; Lederach, 1997) may seem like an unusual place from which to draw analogies to climate change. However, the depth of disagreement, the potentially profound costs of not finding an agreement, and the possibly irreconcilable visions of past and future oriented understandings of the climate change problem, suggest some psychologically structural similarities to other complex conflicts.

Despite the significant variation across peace and reconciliation contexts, several central insights emerge that may be of use to the climate context. First, peace and reconciliation processes depend on addressing enough of the core long-term needs of both parties. Second, the existing situation has to be sufficiently problematic that they are willing to accept something less than they ultimately prefer: they need a 'hurting stalemate' (Zartman, 2001).

From the perspective of the 'victims', acceptance of an agreement is motivated by the desire for fundamental change. In order for an agreement to feel acceptable, the structures that facilitated the injustices must be remedied directly so that material conditions change and future injustices can be avoided (Zartman et al., 2005). Simultaneously, some injustices cannot be remedied or compensated for. In these situations, mechanisms are needed that acknowledge injustices appropriately, even if these efforts do not immediately change material circumstances.

From the perspective of 'perpetrators', agreement may be motivated by the psychological and material costs of the continued tension. However, in order to be acceptable some boundaries of retributive justice may be needed. Specifically, liability for the injustice needs to exist within some set boundaries and there has to be a point at which responsibility ends (Zartman et al., 2005).

Together this suggests the necessity of balancing 'backwards-looking justice' and 'forwards-looking peace' (Zartman et al., 2005). Although it is debatable whether or not a 'hurting stalemate' currently exists in the climate context, it may still be productive to ask: at their core, what do parties with fundamentally different ideas of justice need in order to find a space of resolution?

For those with significant development needs, and facing an expectation of negative climate impacts, at least two concerns are central. The first would be the fear that the global community fails to recognise their need not only to survive but to improve wellbeing. The second fear would be that climate impacts become sufficiently severe to undermine sustainable development.

For those who have historically emitted the greatest amount of GHGs, the key tensions are also likely multi-faceted. One element would be the concern that there are no obvious boundaries to the extent of causal responsibility, especially in the areas of adaptation and loss and damage. The worst-case fear here could be a never-ceasing set of 'demands' that impede other domestic and international goals. A second fear could stem from a recognition of the need for sufficient mitigation while acknowledging that many future emissions will be outside the control of historical emitters. Mitigation will become dependent on emission reductions from developing countries.⁶

This analysis suggests that for developing countries, at least two profoundly structural shifts would be required for them to 'forgive' historical responsibility (while recognising that this would be a second best option for them). First, they would likely require guarantees of new pathways towards sustainable development. This might include traditional commitments to development and adaptation. It could also include longer-term transformational options such as efforts to enhance domestic capacity to the point at which not only were they able to benefit from existing low-carbon and climate-resilient technologies, but also actively contribute to global R&D in new, appropriate technologies. Although this goes substantially beyond the purview of climate negotiations, it is possible that broader economic or trade arrangements could also be seen as part of a structural shift designed to make the global playing field more 'fair'. A second likely element would be significant mitigation commitments in the short term from developed countries.

Developed countries would also need several things in exchange for providing substantial development support, agreeing to structural changes (e.g. a different approach to technology development and transfer and/or broader economic arrangements), and concrete mitigation commitments. The first would be an agreed, final settlement about the extent of causal responsibility. The second would be a broadly collective agreement about future emissions reductions, possibly with long-term but firm emissions commitments from developing countries.

⁶ This is admittedly an extremely crude and un-nuanced characterisation of the problem of climate policy and is created only for the purposes of distilling what core elements a backwards-looking justice, forwards-looking peace approach might look like.

Conclusions

The utility of fairness stems from its dual foundation in the perceptions of each individual actor in a situation and in ideas of equity. It offers a middle road between completely self-interested positions and principle-based equity frameworks. This is not a call to an 'anything-goes' approach to negotiations: if actors do not genuinely consider the perceptions of others, their propositions are likely to further erode trust and cooperation and lead to political stalemates. In order to be effective as a tool for negotiation, claims of fairness cannot be divorced from concepts of equity.

Instead, it is suggested that a constructive use of fairness in climate-policy negotiations would entail greater understanding of the relationships in which parties find themselves. For example, it strongly suggests that a continued focus on zero-sum burden sharing erodes the ability for parties to consider the needs and interests of others. This limits the chances of finding meaningful and useful resolutions.

Similarly, attention to the multiple dimensions of causality could lead to greater chances of finding mutually acceptable resolution across different specific elements of climate policy – including mitigation, adaptation, and loss and damage.

Finally, it may be time to start finding a balance between backwards-looking justice and forwards-looking transformation. Such a balance would not only require significant technical and financial elements but its acceptance would, ultimately, be rooted in the psychological needs and fears of all parties.

All of these observations remind us that climate-change policy is ultimately about human decision-making. Perhaps it is time to put social-psychology back into our policy analysis toolkit.

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The International Law Association's legal principles on climate change

Christoph Schwarte¹

Abstract

In April 2014, the International Law Association (ILA) adopted draft articles on the existing legal principles relating to climate change. Developed by leading legal scholars, these draft articles formulate potential guidance to states in their joint efforts to tackle climate change and negotiate a new international agreement. The principle of common but differentiated responsibilities is considered here along with other crucial findings. The draft articles hold that states' commitments shall evolve over time as their contributions, capabilities and national circumstances change. The concept of special circumstances and vulnerability to climate change provides a qualitative criterion for the differentiation between developing countries. With regard to a new international agreement, the ILA's work suggests that although industrialised countries are accountable for the adverse effects of certain anthropogenic GHG emissions, a flexible framework that departs from a formal differentiation between parties is required. Only a robust agreement that ensures the flow of significant resources will create the necessary preconditions for managing the remaining atmospheric space as a common natural resource.

Introduction and background

The International Law Association (ILA) was founded in Brussels in 1873. Its objectives include the study, clarification and development of international law. These objectives are pursued primarily through the work of its international committees and biennial conferences. In November 2008, the ILA established the Committee on the Legal Principles Relating to Climate Change. Over the following five and half years, the committee developed a set of draft articles and commentary that reflects the members' combined jurisprudential analysis and research into state practice, international treaties and jurisprudence.

The draft articles, with commentary on the legal principles relating to climate change, were adopted during the joint conference of the ILA and the American Society of International Law in Washington, DC, in April 2014.² They summarise the fundamental legal principles that should guide states in their attempts to address climate change. These include the development and operation of an effective legal regime on climate, and also their conduct outside the existing legal framework (mainly the United Nations Framework Convention on Climate Change and the Kyoto Protocol) and a situation without a new agreement in 2015.

However, this short paper focuses on their potential impact on a new global deal, in particular the possible differentiation between the parties. While the content and design of the new agreement will depend on political consensus and compromise solutions, the existing public international law can inspire and influence the ongoing international negotiations. It may also help to mediate disputes between different negotiation positions by reference to wider international legal principles that provide a comprehensive approach to global environmental justice.

Common but differentiated responsibilities

The ILA committee found that all states have a responsibility to contribute towards an effective climate change regime and the multilaterally agreed global goal subject to their national circumstances.³ It addressed the question of differentiation as part of the principle of common but differentiated responsibilities and respective capabilities (CBDRRC). It holds that states' commitments shall fall along a spectrum and evolve over time as their contributions, capabilities, economic fortunes and national circumstances evolve.⁴

¹ The author is the director of the Legal Response Initiative (LRI). He has been a member of the ILA Committee on the Legal Principles relating to Climate Change but the views and opinions expressed in this note are his and cannot be attributed to the ILA or its Committee.

² The full text of the draft articles and commentary and other documents of the committee are available at <http://www.ila-hq.org/en/committees/index.cfm/cid/1029>.

³ ILA, Legal Principles relating to climate change [hereinafter ILA Legal Principles], draft Art. 5 para. 2.

⁴ ILA Legal Principles, draft Art. 5 para. 4.

Contributions to climate harm, however, also remain relevant in determining differentiated responsibilities. The UNFCCC (United Nations Framework Convention on Climate Change) includes a preambular recital noting that the 'largest share of historical and current global emissions of greenhouse gases has originated in developed countries'. The 2011 Cancun Agreements note that owing to 'historical responsibility, developed country Parties must take the lead in combating climate change and the adverse effects thereof'.⁵ Responsibility for greenhouse gas (GHG) emissions across different temporal spaces, therefore, forms part of the CBDRRRC principle. It neither privileges those that committed GHG transgressions in the past and benefitted economically, nor those that commit such transgressions today without regard for the future.⁶

Principle 7 of the Rio Declaration⁷ assigns a leadership role to industrial countries based on their enhanced contribution to environmental degradation. Arguably, this reinforces Art. 3 UNFCCC (which contains no corresponding express reference).⁸ By moving away from the formal differentiation between developed and developing countries, the draft articles provide that the determination of different responsibilities must reflect historical, current and future contributions to climate change, along with technological, financial and infrastructural capabilities, as well as economic fortunes and national circumstances.⁹

As a result, developed countries, particularly the more advanced, by virtue of their leadership role are required to undertake more stringent mitigation commitments and to assist developing states. Their responsibility to assist others in addressing climate change and adapting to its adverse effects applies, in particular, in relation to the least developed countries (LDCs), small island developing states (SIDS) and other vulnerable nations.¹⁰ This draws directly from the balance of responsibilities in the UNFCCC and its Kyoto Protocol.

Developing states, in particular LDCs, SIDS and other vulnerable states shall be subject to less stringent mitigation commitments, and benefit from, for example, delayed compliance schedules and financial, technological and other assistance.¹¹ The reference to specific groups recognises the differences that exist among developing countries. In this connection, the concept of special circumstances and vulnerability to the adverse effects of climate change has become an important qualitative criterion.¹²

As the result of a convention drafting process that had to integrate conflicting interests, the concept of special circumstances and vulnerability under the UNFCCC is wider than Principle 6 of the Rio Declaration, which provides that '[t]he special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority...'.¹³ The UNFCCC, in addition, also refers to oil-producing developing countries that would be particularly affected by response measures.¹⁴ However, the notion of vulnerability to climate-change impacts has emerged as a primary concern. In the subsequent practice, Parties to the UNFCCC have effectively reinterpreted 'special circumstances and vulnerability' in the sense of Principle 6 of the Rio Declaration.¹⁵

Article 6 also emphasises that, as part of their CBDRRRC, developed countries have an obligation to provide support in developing countries.¹⁶ As mitigation and adaptation efforts will not prevent a degree of loss and

⁵ Decision 1/CP.16, The Cancun Agreements: Outcome of the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, FCCC/CP/2010/7/Add. 1, para. 35.

⁶ ILA Legal Principles, draft Art. 5, Commentaries para. 9.

⁷ Rio Declaration on Environment and Development, 13 June 1992, A/CONF.151/5/Rev.1, reprinted in (1992) 31 ILM 874 [hereinafter Rio Declaration].

⁸ ILA Legal Principles, draft Art. 5, Commentaries para. 6 with reference to L. Rajamani, The reach and limits of the principle of common but differentiated responsibilities and respective capabilities in the climate regime, in N. K. Dubash (ed.), *Handbook of Climate Change Law and India* (2012). Oxford University Press, Oxford, 118 and 121.

⁹ ILA Legal Principles, draft Art. 5 para. 3.

¹⁰ ILA Legal Principles., draft Art. 5 para. 3 (a).

¹¹ ILA Legal Principles, draft Art. 5 para. 3 (b).

¹² ILA Legal Principles, draft Art. 6.

¹³ Rio Declaration (see footnote 7 above).

¹⁴ UNFCCC, Art. 4 para. 10.

¹⁵ For example: a special work programme for LDCs and the LDCs Expert Group were established. The treatment of small island developing states on an equal footing with LDCs was reinforced by the Nairobi Work Program.

¹⁶ ILA Legal Principles, draft Arts. 5 para. 3 (a) and 8 para. 4.

damage, the international community is debating the approaches, methods and tools required to understand and manage risks associated with climate change. In this context, risk transfer and sharing has been identified as a crucial component. Insurance schemes will require the involvement of the private sector, but governments in developed countries have an important role to play in providing start-up finance, credit insurance and additional support where the development of commercial products is problematic.¹⁷

Other findings

Other relevant legal principles addressed by the draft articles are sustainable development (draft Art. 3), equity (draft Art. 4), prevention (draft Art. 7A) and precaution (draft Art. 7B), international cooperation (draft Art. 8), good faith (draft Art. 9), and the inter-relationship between different areas of international law (draft Art. 10). The committee did not accept that 2°C of global warming had yet become a legally binding target and reached several other important conclusions:

- It has been disputed amongst lawyers whether the principle of prevention or ‘no harm’ developed and generally recognised in the context of transboundary pollution, can also be applied to GHG emissions that alter the composition of the atmosphere.¹⁸ Draft Article 7A says so.¹⁹ In order to meet their obligation, states must act with due diligence to avoid, minimise and reduce damage through climate change.²⁰ The draft articles deliberately do not address the consequences of non-compliance. But if a state fails to meet the standard of care (e.g. to monitor and control domestic sources of pollution) that – in view of its resources and capabilities – must be expected, failure to take proportionate action may amount to an international legal wrong.²¹ As a result, it would be obliged to discontinue the wrongful act and make reparation for the injury caused.
- Although prevention is directed at situations of known risks or foreseeable harm precaution, the need to take measures despite the lack of conclusive scientific proof operates in advance of this. The committee emphasises the close link between the action required under both approaches by addressing them in the same Article 7 (as A and B). This has been largely based on recent international jurisprudence and the state practice of the European Union.²²
- The draft article further specifies significant procedural elements of prevention and precaution in the climate-change context. States have an obligation to continuously assess the adequacy of their efforts to tackle climate change in the light of new scientific knowledge; undertake environmental impact assessments that take account of possible adverse effects on other states and areas beyond national jurisdiction through climate change; and not only consult with potentially affected states but cooperate with a view to reaching a joint decision.²³ This could have significant impacts on large-scale infrastructure projects, new power plants and the extractive industries.
- The global atmosphere is described as a ‘common natural resource’ in draft Article 3. While natural resources can be appropriated, the committee has avoided the term ‘common property’. This reflects that, although the atmosphere partially falls within territorial sovereignty, it is shared by all states. It also emphasises the need for protection *vis-à-vis* utilisation. State sovereignty over atmospheric space must be exercised in the interest of humankind – for the benefit of present and future generations.²⁴ Access is limited and, regardless of who enjoys sovereignty, the totality of the global atmosphere must be managed as one in accordance with internationally agreed rules.

¹⁷ ILA Legal Principles, draft Art. 6 para. 3, Commentaries para. 6.

¹⁸ The principle of prevent provides that states have an obligation to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states and areas beyond the limits of national jurisdiction. See, for example, International Court of Justice, *The Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996 ICJ Reports, 226, 242.

¹⁹ ILA Legal Principles, draft Art. 7 A para. 1.

²⁰ ILA Legal Principles, draft Art. 7 A para. 2.

²¹ In addition, the damage would need to be at least serious, substantive or significant; the duty to prevent must be balanced in each case against the sovereign right to exploit resources and development economically. A possible justification or waiver may also be part of the assessment.

²² ILA Legal Principles, draft Art. 7, Commentaries paras. 1-2.

²³ ILA Legal Principles, draft Art. 7 B paras. 3-6.

²⁴ ILA Legal Principles, draft Art. 3 para. 1, Commentaries para. 4.

- These rules, however, need to reflect other important objectives, such as the realisation of human rights and poverty eradication too. With reference to the ILA 2002 New Delhi Declaration on Principles of International Law relating to Sustainable Development,²⁵ the draft articles underline that the protection of the climate system must be balanced with economic and social development. Thus, increasing GHG emissions in developing countries remain to some extent justified.

Potential impact

Although the work of the committee has been a fairly academic process, with a focus on defining the applicable law, some of the draft articles' final language is also the result of carefully crafted compromise solutions to accommodate different views and opinions. Stronger participation by lawyers from developing country jurisdiction may have led to more controversial findings on, for example, the right to equitable utilisation of the atmosphere over time, to continuous development in industrialised countries or technology transfer.

Overall, the draft articles with commentary are an important step in the progressive development of public international law. For too long, climate change has been perceived as an environmental problem. The committee's work underlines its cross-cutting effect on society and all areas of the law. Whether the political negotiation process takes note of some of the concepts and notions enshrined in the law remains to be seen.

More detailed research on specific questions, such as how to define vulnerability, the causation between GHG emissions and the negative effects of climate change, as well as governments' capacity to understand the risk of GHG emissions and adequately respond at different points in time, may help to strengthen their impact. In addition, a draft legal instrument or model agreement based on the ILA principles could instigate new discussions amongst governments.

Some clear guidance in the draft articles already exists for the climate negotiations. The UNFCCC is a living instrument. In order to allow, encourage and award the best efforts in addressing climate change, a flexible framework that departs from a formal differentiation between parties is required. At the same time, developed countries are accountable for the adverse effects of certain anthropogenic GHG emissions, and their previous conduct remains an important part of the picture.

Rather than solely embarking on completely new international arrangements, developed countries need to make good for their GHG emissions. The existing legal commitments and burden-sharing agreements (under the UNFCCC and Kyoto Protocol) need to inform the new 2015 global deal. This means significant, reliable and effective financial support, technology transfer and capacity building. Only a robust new agreement that ensures the flow of significant resources will create the necessary preconditions for developing countries to pursue a low-carbon development path and – from 2020 when the new agreement is expected to enter into force – for managing the atmospheric space as a common natural resource.²⁶

²⁵ ILA Legal Principles, draft Art. 3 paras. 3-4.

²⁶ See above (4th bullet point) on the concept of common natural resource and its implications.

Application of the CBDR principle in the 2015 Agreement

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Abstract

The principle of common but differentiated responsibilities (CBDR) is one of the founding principles of the UNFCCC. A key issue for the ongoing negotiations concerning the 2015 Agreement is how to apply the CBDR principle, particularly the 'differentiated responsibilities'. Currently, there are two polarised options on the table: to maintain the traditional distinction between developed and developing countries or to use a general country-specific contribution to reflect differentiation. Based on the analysis of the key factors that determine the principle of the CBDR, a hierarchical approach is proposed as a possible compromise. This alternative provides an additional category of 'capable developing countries' and could unlock the debate around the application of the CBDR in the 2015 Agreement.

Introduction

The principle of common but differentiated responsibilities (CBDR) is a key principle in the multilateral environmental agreements, and also one of the founding principles of the UNFCCC (United Nations Framework Convention on Climate Change). Each country has a common responsibility to make contributions to mitigate climate change, as this is a global challenge and affects everyone. However, due to the differences in historical responsibilities and capacities, and a right to future development, the responsibilities of different countries are also considered as 'differentiated'. Traditionally, the principle of the CBDR has been operationalised under the Convention through a binary approach, dividing developed countries and those in transition (Annex I) from developing countries (non-Annex I).

It is 20 years since the implementation of the UNFCCC. The world is now expecting a new agreement under the UNFCCC to be adopted in 2015 (referred to as the 2015 Agreement). This new agreement should further enhance international cooperation on climate change. It also should be effective from the point of view of the objective of UNFCCC, i.e. avoid dangerous climate change. Over the past 20 years the world has undergone significant changes in economic development as well as GHG emission patterns. Whether and how the principle of CBDR could be reflected in the 2015 Agreement is a fundamental question in the current negotiation process (Ad Hoc Working Group on the Durban Group for Enhanced Action – ADP). Parties still have very divergent views on this matter. This paper reviews the basis of the principle of the CBDR and proposes some specific suggestions on how to operationalise the CBDR in the 2015 Agreement.

CBDR in the 2015 Agreement

The importance of CBDR

Increasingly robust scientific evidence has confirmed that climate change is a common threat to humanity. To address this problem, enhanced international cooperation is needed. This raises the challenge of how to ensure both ambition and equity in the 2015 Agreement, while enhancing cooperation. The principle of CBDR is a concrete manifestation of equity concerns. No matter how the world is changing, the principle of the CBDR is still valid. As long as the climate-change issue has not been solved, all of us have a common responsibility to cooperate to address this matter. In the meantime, the specific responsibility of every country to address climate change will be different, in accordance with its different historical responsibility, capacity, development phase and future need.

Although CBDR is still a valid principle, it does not necessarily mean that the application of the CBDR in the new agreement should be as the same as under the Convention. An effective agreement should reflect the circumstances and changes in the world. A brief review is presented below to understand what has changed and what is unchanged.

Differentiation between developed and developing countries

The general differentiation between developed and developing countries is one of the UNFCCC's key features in applying the principle of the CBDR. This division reflects the general differentiation between these two groups in terms of historical responsibilities, capacities and rights for future development. Are these general differentiations still valid?

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Historical responsibility

The accumulated GHG emissions from developed countries since industrialisation is the major cause of the current temperature rise. Although the current emissions from developing countries exceed those of developed countries, the cumulative emissions of developing countries are still far lower than those of the developed countries as estimated in the recent IPCC AR5 report (Figure 1). Furthermore, the gap is even larger if the emissions per capita are counted.

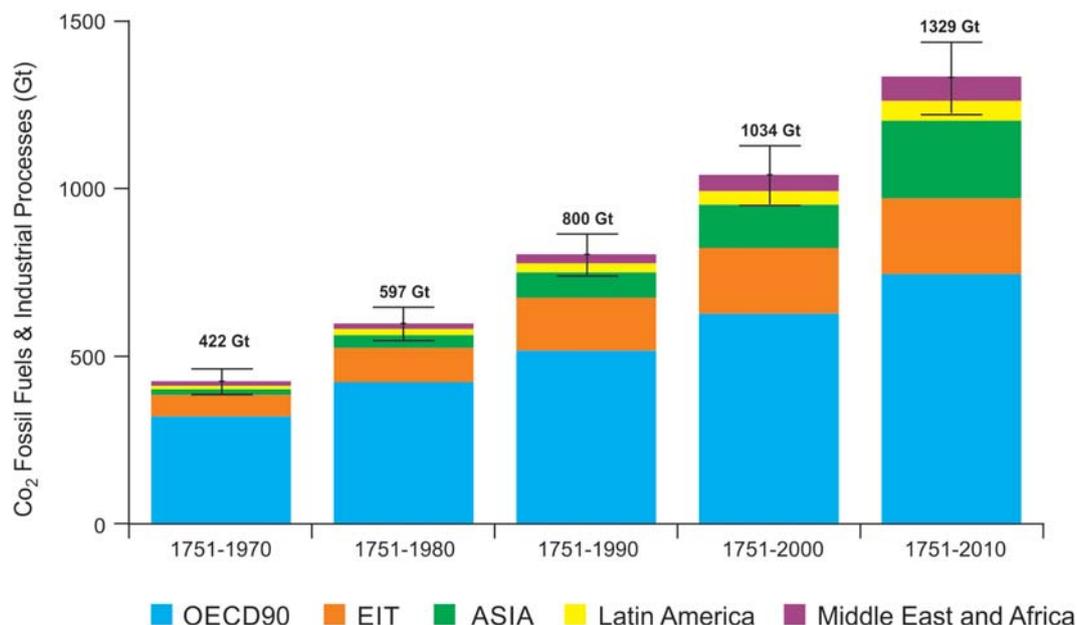


Figure 1. Cumulative emissions of CO₂ from fossil fuels and industrial processes

Source: adapted from the IPCC AR5 WG III report Figure 5.3

Development stages and respective capacity

Although many developing countries have recently achieved considerable economic progress, a gap still remains when compared with the developed countries. A comparison of the latest economic and social data will confirm the validity of a binary division between the developed and developing countries. Although the Annexes to the Convention were made in 1992, it is argued that this principle is still sound. A comparison is presented of the Annex I/II to the High Income Country (HIC) group under the World Bank's income classification and the Very High Human Development (VHHD) country group under the UNDP's human development classification (UNDP, 2013). All the Annex II countries and 85% of Annex I countries are at the high income and very high human development level; 72.3% of the VHHD countries and about half of the HICs are Annex I countries. That means that among the 155 non-Annex I countries only 8.3% are in the group of VHHD and 26.4% are HICs. Although some developing countries do have a higher income level, if a more comprehensive indicator, such as the Human Development Index, is applied, then the development level of non-Annex I countries is still far behind the Annex I countries. In general, that probably reflects the concern of many developing countries that the division between developed and developing countries is still reasonable and should be maintained in the new agreement.

Table 1. Comparison between the Annex I/II and High Income Country (HIC) group, Very High Human Development country (VHHD) group

	% In the HIC (World Bank, 2013)	% In the VHHD (UNDP, 2013)
Annex I countries	85.7%	85.7%
Annex II countries	100%	100%
Non-Annex I countries	25.4%	7.2%

Needs for future development

The developed countries have generally completed their industrialisation process and arguably have reached a relative stable stage in terms of social and economic development. Their key objective is to maintain the level of economic development and quality of life rather than achieve further significant development progress. It is relatively simple for them to address climate-change mitigation. The general strategy is to reduce their locked-in situation of high-carbon dependency. In comparison, the challenge for developing countries is complicated. Development is still the top priority objective for both middle-income and low-income developing countries. If there is no development, then there will be no basis for sustainability at all. On the other hand, it is also true that the traditional development pattern will not be suitable for developing countries due to limitations of resources and sustainability. They require a new, innovative pathway that is as yet uncharted. In terms of climate-change mitigation, the developing countries and developed countries actually face a future development context with a significant difference.

In conclusion, although significant changes have occurred over the past 20 years, those changes probably can still be considered as evolutionary instead of radical. Therefore, from the perspective of many developing countries, the division between developing and developed countries remains the key feature in defining country groups for addressing climate change.

Evolution within the developing country group

Over the past 20 years, the group of developing countries has evolved significantly due to economic growth. The per capita GDP of some developing countries is now close to \$10 000. This is still lower than that of developed countries but also obviously higher than that of the least developed countries (LDCs). In the meantime, the dramatic growth in their emissions is driven by their economic development. The challenges for these countries are to eradicate poverty and achieve sustainable social and economic development, as well as ensuring high-quality development in the future. Compared to those LDCs, these developing countries have more capacity to mitigate and adapt to climate change, and to absorb advanced techniques and practices from developed countries. Capacity to provide support to the LDCs is emerging in these countries. Thus there are strong expectations for more ambitious contributions of 'capable developing countries'.

Other factors influencing country grouping

In fact, there is no strict definition of developed and developing countries. The country groupings under multilateral mechanisms evolved slowly over time, and are not based on simple criteria. Self-classification, cultural and geographic linkages all play important roles in the evolution of country groupings. Factors such as an alignment to others in a similar development phase, similar expectations or needs in future development, cultural and geographic linkages, and the political position and influence of a country also inform a self-defined sense of belonging to certain clubs. The current composition of the Annexes in the UNFCCC actually is a reflection of all these different factors. A significant change to a country classification in the climate regime would not be acceptable to all Parties, if it is based only on short-term changes in the economy and GHG emissions.

Operationalising CBDR in the 2015 Agreement

The two most important aspects of the 2015 Agreement relate to CBDR. One is how to ensure that the collective efforts of all countries meet the requirement to achieve the Convention objectives of stabilising GHG emissions or (more specifically) not exceeding the 2°C target. The other is what exactly the contributions of each country will be. Those two aspects actually reflect 'common' and 'differentiation' respectively. Thus, the question of how to operationalise CBDR is at the core of the 2015 Agreement.

Nationally determined contribution

According to the decisions of Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP), the 2015 Agreement should be applicable to all Parties. All parties should contribute to combatting climate change. In the 2013 Warsaw COP, it was decided to invite all Parties to initiate or intensify domestic preparations for their intended nationally determined contributions (INDC) and to communicate them well in advance of the 21st COP. In general, the 'common' part of CBDR is actually being operationalised by the concept of INDC. The operationalisation of differentiation becomes the key to unlock the development of a new agreement.

General differentiation between countries

Regarding differentiation, there are now two polarised options on the table. One is to maintain the traditional distinction between developed and developing countries. The other is to use a country-specific contribution to reflect differentiation naturally. Technically, both of them could be applicable. However, to reach a new agreement, the differentiation approach must reflect the reality of objective differentiation but also the subjective perception of all participants. Both options might not be promising in light of the current debate. Therefore, a hierarchical approach is proposed here as a compromise in order to address all concerns in a more balanced manner.

As shown in Figure 2, the division between the developed countries (Annex I) and the developing countries in the 2015 Agreement should be kept as the first level of grouping. A new subdivision within the developing countries could then be made according to different capacities and national circumstance. During the last 20 years, significant progress has been made in some developing countries in terms of economic and social development, which place these countries in a better position than other developing countries to address climate change. These countries could be considered as 'capable developing countries' and therefore could contribute more to combatting climate change in the context of sustainable development.

In general, the developed countries should continue to take the lead in climate-change mitigation and should provide support on finance, technology and capacity building to the developing countries. The developing countries should enhance mitigation and adaptation actions in the context of sustainable development, with the support from the developed countries. The new group of capable developing countries could voluntarily commit to absolute mitigation targets and provide support to other developing countries. This South-South cooperation could facilitate information sharing and substantial cooperation for both climate change and sustainable development. This approach is similar to the approach adopted in the Convention in defining the Annex II and non-Annex II countries within the Annex I framework.

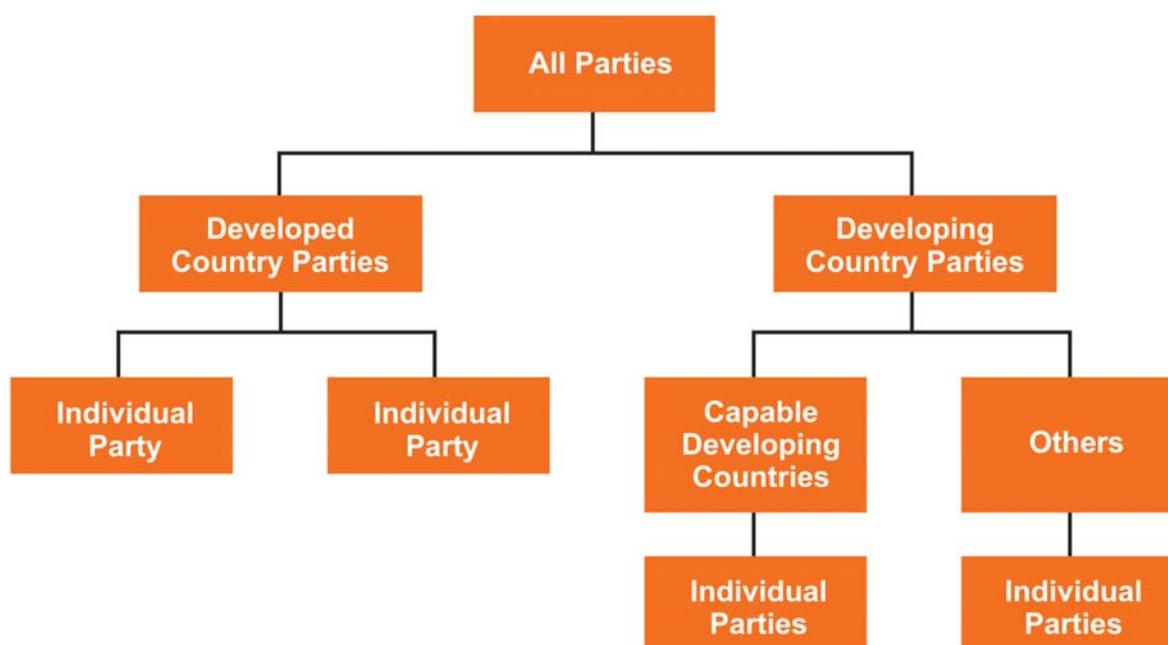


Figure 2. Binary approach and subdivisions to reflect differentiation in combatting climate change

CBDR for specific elements of the 2015 Agreement

Mitigation

Developed countries should continue with quantitative economy-wide emissions reduction targets (relative to the same base year) to ensure that there is no backsliding. For developing countries, the mitigation contribution can be diversified. Capable developing countries should be encouraged to set quantified emissions limitation targets in line with their future development pathways that pursue sustainable development. Conditional contributions could be allowed to encourage a wider range of developing countries to enhance mitigation efforts.

Adaptation

Every country will presumably undertake adaptation according to their own interests and needs. However, developed countries should support the developing countries (particularly the LDCs) in preparing and implementing their national adaptation programmes. Capable developing countries will be encouraged to share their experiences and lessons with regard to adaptation of climate change with other developing countries.

Finance, technology, and capacity (FTC) building

Capable developing countries may have different needs for financial and technological support from other developing countries. Financial, technological and capacity building support from developed countries to developing countries would still need to be substantially enhanced. This could facilitate mitigation and adaptation activities based on the current arrangement. Within the group of developing countries, capable developing countries could also provide such support through South-South cooperation, triangular cooperation or other approaches. Developing countries would further identify needs for support to address climate change and enable domestic environment.

Measurement, reporting and verification (MRV)

MRV should be enhanced for both developed and developing countries and efforts should be based on the current system developed since the Cancun COP. For developed countries, MRVs for finance, technology and capacity building support should be enhanced to reach the same level as MRV on mitigation. A common goal could be an MRV system with a common standard for both developed and developing countries. Flexibilities in MRV for the developing countries should be allowed due to the limitation of capacity. Capable developing countries should evolve gradually to the common MRV system, starting with an accuracy requirement that is less strict.

Legal form

Legal form is an important factor that will influence the effectiveness of the 2015 Agreement. The 2015 Agreement should have a strong legal and binding force. As long as the differentiation can be reflected in the substance of the contributions, the contributions of all the Parties could have the same legal nature with the same legal form.

Table 2. Summary of proposed common but differentiated responsibilities (CBDR) for developed and developing countries in the 2015 Agreement

	Developed countries	Developing countries	
		Capable DCs	Others
Mitigation	Economy-wide emissions reduction target	Emissions limitation/control target in line with sustainable development goal	Nationally appropriate mitigation actions
Adaptation	National adaption plan and contribution to the global adaptation goal	National adaptation plans	Implement National adaptation plans with support
Finance, technology and capacity building	Provision of FTC to developing countries	South-South and triangular cooperation	Identify needs and provision of enabling environment
Measurement, reporting and verification	Continuation of current approach with common accounting rules. Enhance MRV on support	Gradually move to common approach while less strict on accuracy	Flexibility applied
Legal form	Same legal nature		

Concluding remarks

Only 18 months remain for negotiation on the 2015 Agreement. The implementation of CBDR involves several key elements of the new agreement, and is among the major concerns of the Parties. There may be no time to discuss the implementation of the CBDR in general. It might also be impossible to have an up-front consensus for Parties to agree how to reflect CBRD. However, this important differentiation will spread into the discussion of every element. Regardless of how it is achieved, to some extent the 2015 Agreement will be interpreted as an agreement to operationalise CBDR in a timely manner.

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Climate change ‘clubs’: illustrative issues from international maritime shipping

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Abstract

The purpose of this paper is to elucidate and illustrate features of ‘clubs’ in the political economy literature, as applied to climate-change issues. The concept of ‘clubs’ is explored as a basis for developing an international climate-change institutional architecture. In an abstract sense, the benefits of clubs should only be available to participants in club-like institutional arrangements, in contrast to public goods, which are available to non-participants as well. However, in practice, there can be complementarities in the sense that public-good benefits (e.g. climate-change mitigation) can result from a club-goods benefit (e.g. increased fuel efficiency). There are promising opportunities for conceptual, empirical and case analyses that could contribute to efforts to advance a club-goods approach to climate-change issues. The international maritime shipping industry is used to illustrate the generic issues. It is a useful industry for illustrative purposes – as well as being inherently important itself – as core climate-change issues are energy-related and also involve a broad range of issues involving several GHGs and black carbon particles, and a variety of international regulatory initiatives.

Introduction: public goods, club goods and climate change

Climate change is widely recognised as a problem that poses extraordinarily challenging public goods issues. The release of greenhouse gas (GHG) emissions into the atmosphere from anywhere in the world have effects everywhere in the world. The same is true for measures to mitigate emissions. Both situations pose free-rider problems. Club goods are explored here as a way to address the free-rider problems through incentives to participate in and comply with international climate-change agreements. By definition, a club-like institutional arrangement must have these features: some benefits are evident for its members and these benefits are not available to non-members (i.e. they are ‘excludable’). Yet, club goods, such as energy efficiency, can also have public-goods consequences, such as climate-change mitigation.

A club-goods approach and a public-goods approach to the development of an international institutional architecture nevertheless reflect fundamentally different ways of addressing the market failures that are at the core of the climate-change problem – i.e. the externalities (in the form of GHG emissions associated with the use of fossil fuels as well as GHG emissions associated with other human activities, such as agriculture and forestry).³ As a result of the key difference in the availability or exclusivity of the benefits of participation and compliance, the issues associated with club-goods institutional arrangements extend to a broad range of analytic and policy questions concerning international institutional design. The most consequential of the questions is whether and how a club-goods approach could be more effective than a public-goods approach in mitigating climate change.⁴

International maritime shipping

Issues on the agenda

The drivers of the climate-change agenda in international maritime shipping include the science of GHGs and black carbon; regulations concerning fuel efficiency and other aspects of maritime shipping; the economics of the industry, including the costs of fuels; geopolitics, including in particular the supply of Russian gas exports; and the prospect of increasing maritime shipping in the Arctic region as melting ice opens up shipping lanes. As for the science, climate-change issues are inherent in the three GHG emissions – CO₂ methane and

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² This chapter has been derived from an ongoing study funded by the ICTSD. Discussions at the London Climate Strategies/CDKN conference and subsequent meetings of E15 initiative groups (www.e15initiative.org) sponsored by ICTSD and the World Economic Forum were helpful in clarifying many points. I am also indebted to Haifeng Wang of the International Council on Clean Transportation for several useful comments on a draft. The content of the chapter, however, is entirely my own responsibility as an independent scholar. None of the content should be attributed to the ICTSD or any other organisation.

³ In addition to the emissions of CO₂, methane, nitrous oxide and other gasses, additional climate-change issues are associated with the particulate pollution of black carbon, or soot as it is commonly known.

⁴ The analysis here is derived from a larger study (Brewer, in progress) on the international maritime industry. In order to keep the scope of chapter within the present volume’s size limitations, literature references are kept to a minimum. However, the following especially relevant treatments of club goods can be noted: Andonova (2009), Comes and Sandler (1996), Kolln and Prakash (2002), Sandler (1997); there is a review of the literature in IPCC (2014: ch. 13). The chapter draws on the following concerning the maritime shipping industry: Bodansky (2011), Brewer (2014), Faber (2008), Faber et al. (2012), Hughes (2013), ICCT (2011a; 2011b; 2011c), IGU (2014a; 2014b), IEA (2013), IMO (2011a; 2011b; 2011c), Litehauz (2012) and UCL Energy Institute (2013).

nitrous oxide – plus carbon black particulate emissions that result from fossil fuel consumption in the industry. The long-term increases in the volume of international trade of goods via maritime shipping may pose serious greater GHG emissions problems in the future. Current emissions from maritime shipping (approximately 3% share of world CO₂ emissions) may increase due to long-term increases in the volume of world trade, despite any gains from increased fuel efficiency. In addition, the prospect of increasing fugitive methane emissions from the transport of liquefied natural gas (LNG)⁵ also poses potentially significant climate-change mitigation issues (ICCT, 2013). Methane has a global warming potential (GWP) approximately 80 times greater than CO₂ at 20 years and more than 30 times greater at 100 years.⁶

The regulations include individual governments' regulations for national natural gas systems, including LNG export liquefaction facilities and import re-gasification facilities, and the new International Maritime Organization (IMO) fuel efficiency requirements for vessels in international trade. Due to the importance of fuel costs in maritime shipping, the economic variables of particular interest are the relative costs of diesel and LNG fuels for different types of vessels and cargoes. Future trends and patterns in the international natural gas trade, particularly between maritime shipments of LNG and pipeline deliveries into Europe, depend upon the evolution of the geopolitical context of Russian natural gas exports. There is of course both much uncertainty and much at stake for international maritime shipping in Russia's political use of its gas exports.

Finally, another region-specific issue highly relevant to international maritime shipping and for climate change is the prospect of the increasing use of shipping lanes in the Arctic region as a result of the increasing ice melt in the area. Of particular concern is the extent to which black carbon emitted from ships burning fossil fuels will exacerbate the decline in the *albedo* effect – i.e. will soot from ships reduce the reflective properties of snow and ice on solar radiation?

Fuel efficiency regulations

This brief, introductory and exploratory analysis focuses on fuel efficiency regulations, which are mandatory, tangible and in force, and which will evolve over time. Such standards have been developed in the IMO;⁷ the standards were adopted in July 2011, and entered into force in January 2013 (Hughes, 2013; IMO, 2011a, b, c). The regulations are in the form of amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL), which includes a new chapter, MARPOL Annex VI. It is useful to think of the regulations as a package with the following core elements:

- the Energy Efficiency Design Index (EEDI) for new ships
- the Ship Energy Efficiency Management Plan (SEEMP) for all ships
- guidelines concerning the method of calculation of the EEDI, the calculation of reference lines for use with the EEDI, survey and certification of the EEDI, and development of a SEEMP.

The potential CO₂ reductions have been estimated by an IMO-contracted study (IMO, 2011c; also see ICCT, 2011b) to be 151.5 million tonnes of CO₂ annually by 2020 and 330 million tonnes annually by 2030. Compared with business-as-usual, these are reductions of 13% and 23% by 2020 and 2030 respectively.

Issues for effective implementation

These few highlighted facts about international maritime shipping and the IMO can be used as a basis for deriving propositions about club goods and the design of international institutional architecture for mitigating climate change. The following are illustrative, and not intended to be a comprehensive list. They are offered

⁵ The distinction between liquefied natural gas (LNG) and compressed natural gas (CNG) is also important: the former refers to liquefied natural gas which is cooled to about 163°C and transported by ships and sometimes used by them as a fuel. The latter is used in gaseous form as a fuel in buses and trucks.

⁶ The chemical composition of natural gas as it is extracted is typically about 85% methane (CH₄), with small proportions of other gases and derivatives including propane (C₃H₈), butane (C₄H₁₀), ethane (C₂H₆), ethylene (C₂H₄) and acetylene (C₂H₂). Nitrous oxide has a GWP that is 340 times greater than CO₂ over 100 years. Black carbon is a potent contributor to climate change – like methane, less than CO₂ in its total impact, but greater than other GHGs – and moreover with direct public health consequences from respiratory diseases.

⁷ The IMO has been designated by the UN Framework Convention on Climate Change (FCCC) to be the UN specialised agency responsible for climate-change issues. The IMO has 170 member states and 3 associate members. In addition to the governments representing the 170 members, there are 63 inter-governmental organisations (IGOs) with cooperative agreements and 77 non-governmental organisations (NGOs) with consultative status. The NGOs include a broad array of both industry groups (such as the International Chamber of Shipping), environmental organisations (such as Friends of the Earth International) and technical organisations (such as the International Organization for Standardization). The European Commission (EC) has a cooperative agreement with the IMO, and nearly all of the individual member states of the EU are members of the IMO. See www.imo.org for further information.

for heuristic purposes as thoughts prompted by preliminary consideration of the facts and implications of one industry; they are manifestly not offered as conclusions or even operational hypotheses based on empirical results.

Formal institutional status

A formalised legal status can be helpful for facilitating the effectiveness of a club, but it is not sufficient and may not be necessary.

As the IMO has been delegated to be the specialised UN agency responsible for climate-change issues in international maritime shipping, it has a formal legal status that legitimises it as an international institution. Thus, it is in a relatively strong legal and political position to create club goods, as compared with institutions that are new and/or not formally recognised by the UNFCCC or otherwise by the UN system. It should be noted in this respect that the International Civil Aviation Organization (ICAO) is similarly situated as a UN specialised agency: the ICAO has been granted a special role for international aviation by the UNFCCC, analogous to the IMO's for international maritime shipping. However, the differences in the politics and environmental attitudes between these industries has resulted in the IMO taking climate-change issues more seriously and acting more decisively.

Consensus-building and voting procedures

The requirement of a consensus based on unanimous approval inhibits the creation of club goods.

Although the IMO seeks a consensus, unanimous approval is not required for adopting new policies and programmes. For instance, the EEDI discussed above was adopted despite the opposition of China, India, Saudi Arabia and South Africa.

Defining industry sectors

The diversity of GHGs and black carbon, in terms of their industry sources and climate change impacts, requires that club goods be specified narrowly and precisely.

Although international maritime shipping may seem like a sector that can be relatively easily defined with clear analytic and policy boundaries, and specification of its climate-change impacts, it is in fact highly diverse along many dimensions. For instance, the types of ships define sub-sectors, such as container, bulk transport, LNG, or other. Each one of which has a distinctive profile of climate-change mitigation issues. The relevance of black carbon also varies across sub-sectors, as well as among major industry sectors. In maritime shipping, as in many other sectors, CO₂ emissions are not the only significant issue.

Technological change

Club agreement – as well as public-goods agreements - must be responsive to technological and economic changes in order to be effective.

In the international maritime shipping industry, the widespread use of fracking for natural gas extraction and the concomitant decrease in its relative price compared with other fuels has a significant impact on the types of fuels and thus types and amounts of GHG emissions. It also affects the types of ships being built and the volumes of transport of LNG, and therefore poses additional GHG emissions issues. It is also true of course that many regulatory initiatives are intended precisely to stimulate technological changes.

Industries and other stakeholders

The design of industry-based climate-change clubs needs to be sensitive to the wide range of interests of associated industries, in addition to the core industry of interest.

In addition to the transport services of the maritime shipping industry, there are operators of export and import terminals, maritime insurance providers, naval architects and many other service providers. There are also manufacturers of ships, engines, containers, electronics, plumbing and electrical systems, and other components that go into ships. In addition, the suppliers of the exports and the consumers of the imports are also stakeholders. The long lists of IGOs (intergovernmental organisations) and NGOs (non-governmental organisations) that are affiliated with the IMO are further evidence of how extensive the stakeholders are. Specification of a particular club thus depends on a combination of industry and international institutional variables, as well as governments. Defining the membership of a club and identifying the other stakeholders (some of whom might not be formal members of the club but who might exert influence on formal members) are among the central analytic and diplomatic challenges of creating clubs.

International versus domestic activities

Although the distinction between emissions from domestic sources of GHG emissions and international sources, such as international transport, may be straightforward in territorial terms, it is constraining and distorting in terms of the real tangible extent of economic activities that are internationally integrated.

In particular, in international maritime shipping, 'domestic' national facilities that are built especially for export activities, such as dedicated LNG export liquefaction facilities and LNG import re-gasification facilities, may be physically located within particular countries (with the exception of new off-shore floating facilities) and thus they are elements of domestic national natural gas systems. However, they clearly function as elements in highly integrated international value chains and are thus integral to international transport operations and related GHG emissions.

International versus national domestic regulations

Differences between international and national domestic regulations can cause complexities in the creation of club goods.

In the international maritime industry, for instance, the United States has adopted rules about domestic maritime shipping based on the power of ships' engines, while IMO regulations concerning international shipping are typically based on ships' gross tonnage. Ship architects, builders and operators thus need to be mindful of two sets of regulatory regimes, if a particular ship might be operating in both international and domestic US waters.

Principles of CBDR and non-discrimination

Conflicting core principles among organisations can constrain the development of climate change clubs, but there are also ways to circumvent such constraints.

There is a clash of principles between Common But Differentiated Responsibilities (CBDR) in the international climate regime versus non-discrimination in the trade regime. Although the IMO has been able to resolve the issue in the development of its fuel efficiency regulations, and although the place of the CBDR principle is evolving in the climate regime, the two principles are nevertheless likely to emerge periodically in venues where climate and trade regimes intersect in club-creation endeavours.

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A Quisqueya Platform: catalysing action and finance through mitigation and adaptation synergies

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Abstract

Currently international climate negotiations include diverse views on what ‘counts’ as a ‘contribution’ towards addressing climate change. A new way to reframe the debate is proposed that looks at adaptation, mitigation and financial contributions in a different way. A new focus (and set of actions) are described that support ambition, cooperation and transparency. This will allow adaptation and universal (if differentiated) mitigation to be achieved in synergy with development. The ‘Quisqueya’ concept is a positive indication of shared resources and pooled, collective efforts. It is argued that a ‘Quisqueya Platform’ can exploit synergies between adaptation and mitigation, blend domestic and multilateral finance, and focus action by like-minded parties. Such a collective approach could enhance the positive relations between climate action and national resources and priorities, as well as raise the level of collective ambition through shared common mitigation and adaptation priorities. Collective action along these lines could then help decrease the major collective costs countries will face (impacts), while enhancing development cooperation for participants.

Introduction

For most countries, the major climate costs are those of impacts. These costs arise from action or inaction for both mitigation and adaptation. How might countries address these costs? A proposal for doing this is presented here in the form of the Quisqueya Platform. It is argued that it is possible and desirable to create a highly ambitious domestic agenda that links adaptation and mitigation. The exploitation of synergies between adaptation and mitigation, and the mixture of domestic and multilateral finance, can raise the level of ambition. Collective action in coalitions along these lines can then decrease major collective costs (those arising from impacts), while enhancing development cooperation (Garibaldi, 2013).

An increasing number of Parties are becoming convinced that their actions (and their costs) can be better supported by a smarter approach to collective self-interest and cooperation – including climate co-benefits and synergies. Most Parties within the UNFCCC could minimise their overall costs by acting as early as possible in coalitions across groups (Garibaldi, 2009a). These coalitions are already emerging in different contexts. A focus on mitigation and adaptation synergies can produce direct benefits in terms of reduced impacts⁴ and also co-benefits in the linkages between mitigation, adaptation and finance, and with sustainable development overall (Energeia, 2014; Ramirez et al., 2013).

A similar situation affects many low-and middle-income groups, including the LDCs and SIDs, but also the Independent Alliance of Latin America and the Caribbean (in Spanish: Asociación Independiente de Latinoamérica y el Caribe, AILAC) and the Environmental Integrity Group (EIG) (Vergara et al., 2013), and some high-income countries. If a race to the top is to be supported, then this willingness to cooperate and act boldly should be recognised and supported, regardless of size (Garibaldi, 2013).

An alternative approach is presented. Rather than defining the conditions to receive finance, this new approach suggests countries could define their own options that can then help direct financial flows. Effectively, countries’ actions would outline where money can support additional efforts to bridge collective mitigation gaps. An interesting model is a Quisqueya Platform (QP) – described below. It is designed to change the current debate from what needs to be counted as a contribution to address climate action towards a focus (and set of actions) that supports ambition, cooperation and transparency in synergy with development.

Quisqueya: what’s in a name?

The word ‘Quisqueya’ is a name from the Taino language spoken in the Caribbean before the arrival of Spanish. It denominates the island of Hispaniola, which the Dominican Republic and Haiti currently share. That island provides a clear example of how mitigation and adaptation synergies could operate across countries with different development levels. This approach recognises both the disparity of income and the inexorable linkage of resources.

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³ Ricardo – AEA

⁴ There is increasing recognition that adaptation costs are likely to be unmanageable if global warming reaches 3° or 4°C due to a collective failure to act (World Bank, 2013; ADB, 2009).

The use of 'Quisqueya' is purposely chosen as a positive recognition of shared resources and pooled, collective efforts. Unlike many other countries, in Hispaniola the river is not a natural frontier. Instead, the river is a shared resource and stitches together activities on both sides of the frontier.⁵ As both countries share the river, they need to manage it jointly. Moreover, action on one side (adaptation) needs a careful management of actions on the other (mitigation).

By extending activities to encompass joint activities combining mitigation and adaptation across the Dominican Republic and Haiti, it would raise the level of ambition in both countries. This could contribute to a narrative where adaptation and mitigation work in harmony – not in silos.

The concept is applicable to many regions and sectors across the development divide. For instance, agriculture will require substantial adaptation to a changing climate, and this adaptation in turn can be delivered in a high- or low-emissions manner; forestry can help not only to enhance adaptation, but also to reduce emissions from land-use change; infrastructure will need to be adapted and/or built in the context of a changed climate, but it can also be high or low carbon. Moreover, positive opportunities to exploit these linkages exist across developed and developing countries. Opportunities are likely to be more salient in the more numerous middle- and low-income countries which have less sunken costs in high-carbon infrastructure, and more to lose from impacts in the absence of collective climate action.

Purpose and benefits

The purpose of a QP would be to create a space for early movers and ambitious parties to pledge and then develop highly ambitious actions and intended national contributions that are consistent with their national development priorities. These pledges can combine mitigation, adaptation and help support institutional capacity building (including Measurement Reporting and Verification (MRV) systems), while helping to blend and match domestic and multilateral finance. These pledges reflect the national circumstances of each country, but also highlight the opportunity to collectively do more through cooperation.

A QP could operate as a registry and support platform, under UNFCCC stringency standards and/or as a multi-party club or coalition initiative within them. It would match resources, share experiences and help create/enhance capacity to deliver this high ambition. Such a platform could also provide a space for informed interaction between participants. The platform could deliver and implement practical examples which exhibit leadership and high ambition.

A key benefit of a QP is making visible and articulating the links between a country's national development goals/plans and their intended climate actions. In turn, this would allow them to substantially raise their level of ambition.

By sharing the experiences amongst countries, the QP could also facilitate the preparation of intended nationally determined contributions (INDCs). The confidence provided from this process could lead to an ambitious 2015 Agreement.

As a process, a QP could help Parties and non-state actors:

- To advance a narrative of differentiated but ambitious action by all Parties, developed and developing. For example, to deliver the required mitigation to deliver a 1.5° – 2°C future
- To support and add visibility for countries and relevant non-state agents' actions combining mitigation and adaptation, in terms of programme articulation, finance and MRV
- To develop shared thinking on how to advance and MRV solutions for these challenges for both low-carbon and climate-resilient development
- To create capacity, support local action and international cogent discussion across traditional negotiating groups

⁵ For example, the Artibonito River starts in the Dominican Republic, passes into Haiti, and then goes back into the Dominican Republic. Across this river basin, new activities occur to join together agriculture practices that can help improve adaptation and climate resilience, with hydropower flow or river power plants and energy diversification and security (Ramirez, 2013; Crawley, 2012).

- To help mobilise and match domestic and multilateral finance by sharing efforts and resources across participants in their drive to raise their collective ambition
- To highlight what participants wish to do, and to help grow what participants support.

These actions could be jointly developed and would support domestic climate action efforts. As an ongoing process, it has the potential to contribute a recurrent review of the collective ambition and generate a high ambition for a multilateral climate-action regime that bridges the collective mitigation gap.

Thus a QP could be a basis from where to gain knowledge, experience and support on how these linkages can support each other to achieve more ambitious outcomes, be stringently MRV'd and engage others willing to identify further examples. It would help to re-establish the links between national climate action and the international regime in mutually supportive ways.

Context

Since the Cancun Pledges were adopted, many countries have developed and begun to implement national climate-change/low-carbon climate-resilient development strategies for their national circumstances and priorities. These strategies have been developed in line with the development priorities of the respective countries – with climate as a co-benefit (but not always only as driving objective) – and are often integrated into national development plans. Thus, national climate strategies favour policies and actions which maximise local benefits (e.g. wealth creation, energy access, health) and therefore political buy-in (Dodwell, 2014).

This progress at the national level has been funded not only from bilateral sources, including fast-start finance, but also from countries' own domestic resources. In some cases, actions undertaken under these strategies have been reported through national communications depending on (voluntary) reporting cycles.

Any future UNFCCC regime would need to be framed in a way which captures the progress made at the national level and recognises the national drivers for that progress. Likewise, countries which have developed national climate-change strategies and actions will expect to recognise how the international regime will support and accelerate their national efforts. In turn, this will provide the confidence needed to propose more ambitious actions, thereby creating a virtuous circle that will help deliver the overall objective of the Convention.

This is particularly important following the Warsaw COP19, where a more formal process to deliver INDCs was launched. An ongoing debate is advancing around the content, scope and process surrounding INDCs. Altogether, the possible content of INDCs inspired around QP principles could include:

- A long-term mitigation goal for a post-2020 period
- Mitigation action activities. These can be articulated within various formats, including strategic programmes that combine mitigation and adaptation within priority sectors, and enhance synergies between them
- National adaptation plans and priorities. These can be supported by specific measures where already developed, which support co-benefits and synergies
- Commitment to develop a national system for MRV/M&E of mitigation. Measurements of adaptation can be included when delivering mitigation co-benefits. If required, this can include a qualitative description where mitigation is providing adaptation support
- Identification of the needs for capacity building, including human and institutional
- Options to blend domestic finance with additional support from private and multilateral finance.

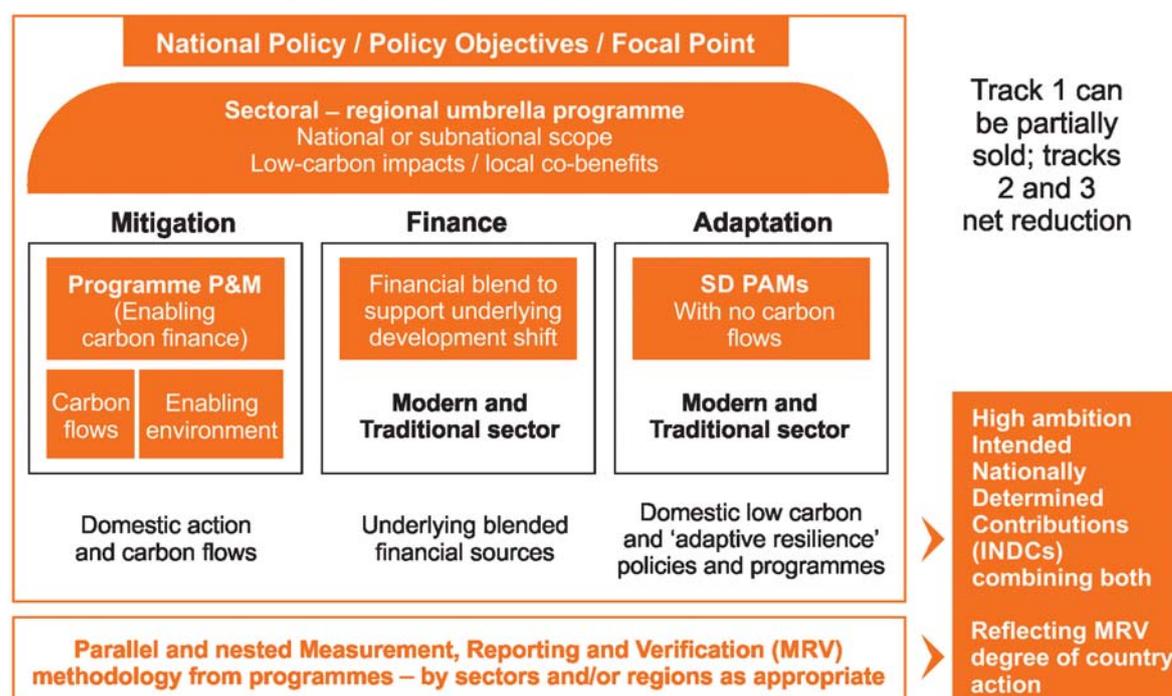
How could this be delivered?

A QP could be delivered in the context of an alternative view of development: embracing universal mitigation action and low-carbon or green growth, but also firmly addressing ongoing serious impacts and the need to minimise climate costs through collective action and cooperation.

Two assumptions underpin this approach. The QP would be open to all countries willing to cooperate: developed or developing. Another is not to start from scratch: it builds and catalyses action around countries' ongoing national development priorities and plans. This harnesses the existing political support and/or the underlying analysis that has already been undertaken.

A QP can provide mutual support and interaction between experts in early action development across adaptation and mitigation silos. Its role is to identify mitigation and adaptation synergies, co-benefits and opportunities for leveraging further action through cooperation by Parties, in parallel with MRV schemes and the finance required to enhance the members own actions. It would provide the opportunities for deploying cooperation and/or market schemes responding to similar issues and circumstances across levels of development.

Advancing these ideas at a domestic level would also require a means to combine activities in both mitigation and adaptation in a mutually supportive environment. A strategic programme approach (or SPAs, see Garibaldi, 2009b) could define a set of measures by public or private agents within a national goal or commitment. SPA objectives which embrace QP ideas would provide the flexibility and environment required for countries to combine mitigation and adaptation activities in ways that support their high ambition mitigation goals, increase the scale of their implementation (including those delivering non-offsetting contributions), and allow non-offsetting mitigation contributions to stand side-by-side with offsets coming from evolving new instruments to transfer other reductions as required. Figure 1 highlights how could this operate.



SD PAMs: Sustainable Development – Policies and Measures

Figure 1. Strategic programme approaches combining mitigation, adaptation and finance

Expected outcome

The focus of a QP is on constructive action. It can provide a vehicle to mobilise countries wishing to do more, within a climate regime with a legal floor specifying mandatory commitments. The role of a QP is to provide additional support to those willing to take more stringent and ambitious early action. It also supports an implicit idea of clubs or coalitions, where countries willing to advance can support each other – within the climate regime rules and principles. It would also emphasise that more action can lead to more cooperation. More specifically, such an approach has the potential to deliver:

- **Visibility:** national contributions can be seen as they are being developed
- **Transparency:** MRV systems would be used for national objectives, rather than being seen as international obligations
- **Comprehensiveness:** responsive to the call by countries involved in regional consultations on INDCs to include adaptation and finance
- **Accountability for action:** requires countries to be clear about when actions achieve national commitments as well as those which will be supported through blended finance
- **A 'coalition' or 'club' approach:** the benefits of membership include increasing the profile and dedicated support of participants
- **Openness:** no limits would be imposed on geographic location. The only requirements for inclusion are ambition and transparency.

Status

The Dominican Republic proposed an approach along QP lines at COP19, and subsequently at various forums leading towards COP21. This has been received with interest by other Latin American, Caribbean and European parties, with a number of them already expressing interest in joining. Similar interest has been received by a number of African countries. Other negotiation groups, including AILAC, the Africa Group and the EIG have also supported linkages between mitigation and adaptation in the context of high ambition efforts. Countries from the Arab and the Like-Minded Developing Country (LMDC) group have also been proposing INDCs including these linkages, but emphasising adaptation. The QP might help create a middle ground – hopefully with high ambition universal action.

Caveats

A few clarifications are provided about this proposal. First: what is not implied. The QP is neither implying nor arguing that only some countries engage in mitigation, and others engage in adaptation. Neither is it saying that some INDCs can be formed with adaptation action alone, or that adaptation is not an obligation towards the most vulnerable; nor that there is no duty by developed countries to lead and support. Second: a QP implies and argues that all Parties and non-state actors need to act – whether tiny, small, or large. (There are many advantages for middle- and low-income countries in participating).

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Introducing public-private technology pools to address climate change

Carlos Rossi¹

Abstract

The development and transfer of technology is an essential pillar of the UNFCCC and is considered crucial for tackling climate change. However, despite efforts to enhance the mechanisms for enabling technology development and transfer, this remains an unresolved negotiation issue. In turn, this impedes the development and effective use of technologies to address climate-change challenges. The causes and reasons behind this impasse are briefly analysed. To overcome the barriers, a new collaborative and inclusive approach is proposed, based on the concept of 'technological integration'. The realisation of this concept in the form of public-private technology pools holds potential as an appropriate and effective venture to address climate change. It could stimulate global scientific and industrial cooperation and integrate stakeholders in regional (or sub-regional) technology centres in developing countries. These pools would produce new technologies and adapt existing technologies for mitigation and adaptation. The advantages of these pools are the creation of enabling environments, the attraction of climate finance, the promotion of international cooperation and investment (foreign direct investment and other venture capitals) while promoting knowledge-based development and driving innovations.

The development and transfer of technology is a key issue in the policy debate on economic development. Despite efforts to improve the understanding of questions surrounding technology transfer,² it is an unresolved negotiation issue in different multilateral forums, including the UNFCCC. This problem is blocking negotiations and constraining global sustainable development. A potential solution is proposed that could resolve this impasse and provide access to technology.

Background

Why is the development and transfer of technology an unresolved issue in multilateral negotiations? What kind of solution is appropriate? A brief understanding of the history and the politics is needed to address these questions. More than 400 years ago Sir Francis Bacon was attributed with the famous phrase '*Scientia est potentia*' which means 'knowledge is power' or 'technology is power'.³ This was at the time of the birth of the modern nation-states. These political and mercantilist states competed against each other, developing, protecting and using technologies for their exclusive benefit.

Arising from this historico-political background, this competitive and technocratic model has endured and grown into a strong driver that was (and continues to be) a key factor in technological change and innovation. Nation-states and companies invest in technological positioning in strategic sectors (Rossi, 2004). Emerging economies (*The Economist*, 2012) are also following this path.⁴ This model continues to drive states to compete in a very aggressive environment with additional pressure on climate-change responsibilities as a consequence.

The concept of technology transfer arose to address the developmental gaps between countries. Despite the evolution of the concept and its inclusion in all the environmental and climate international agreements, it has not done so. It is now used politically and ideologically to block progress in negotiations and to frustrate further cooperation.

Technology transfer is of course linked to issues surrounding intellectual property rights (IPR). Some countries view IPR as a barrier. The objection does not arise from the IPR regime itself but instead is due to the added costs of accessing technology. At the same time, other countries and businesses see IPR as an incentive to innovation. If access to technology is viewed as a source of power, this then creates a political dilemma: should those with technological resources retain them or share them? If it is the latter, what would be a

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² These questions include: what the process of technology transfer entails, how and between which kinds of actors such technology transfer can occur, and how the interface between technology transfer and intellectual property rights can be structured (Sampath and Roffe, 2012).

³ More precisely, the phrase attributed to Bacon is '*Ipsa scientia potestas est*' (knowledge itself is power) in his *Meditationes Sacrae* (1597).

⁴ Typically, emerging economies have more natural resources, large territorial areas requiring infrastructure, lower labour costs and more potential for long-term sustained economic growth.

reasonable approach for doing so? As argued below, technological integration pools offer a potential solution space to resolving these issues through new forms of collaboration that respect IPR.

Some examples already exist of exclusive technological axes, bilateral alliances or clubs between governments and agents of advanced economies.⁵ Transfer of technology occurs through different mechanisms, such as trade and investment, global and regional value chains, non-equity modes of international production and development, e.g. joint ventures, franchising, etc. (UNCTAD, 2011). It also is shaped by bilateral and plurilateral regional trade and investment agreements. However, this has resulted in a thicket of inadequate national systems of innovation, multiple IP regimes and trade protectionism. Taken together, these various arrangements have created institutional and regulatory barriers, instead of enabling environments for technological integration.

Further technical barriers exist. A key issue is a lack of capacity for innovation within developing countries. The concentration of research facilities and scientists is in the developed world and big emerging countries. There are also asymmetries in access to finance and investment in technologies in developing countries.

In the WTO's dispute settlement mechanism database, there are cases of various disputes which arose between developed countries with respect to the domestic content requirement.⁶ Between developed and emerging countries, there are disputes concerning certain measures providing grants, funds, or awards to enterprises manufacturing wind power equipment.⁷

These technology transfer disputes arise as a consequence of many countries still trying to accumulate more power by protecting their markets and companies, or by implementing trade protection measures. A better alternative is to seek more economic and technological integration, especially in those sectors related to climate change, and where differentiated costs suggest delocalisation.

A proposed solution: 'technological integration' and public-private technology pools

A different paradigm is needed to address the current barriers for global technology dissemination. This would place climate change and sustainable development as drivers for technology dissemination and innovation. As market incentives seem to be insufficiently effective for addressing climate-change challenges, and government actions could be stronger if they act jointly and run larger projects, a solution space is explored which considers how this could work. First, a conceptual approach to technological integration is defined. Based on this concept, a new mechanism of 'technology pools' is proposed and explored as a solution.

'Technological integration' would entail:

a collaborative and an inclusive process of exchanging all the knowledge – including local knowledge, skills, technologies, methods of manufacturing, and available facilities among different partners, including governments of developed and developing countries, scientific and research institutions, the private sectors, international organisations and financial institutions. These stakeholders would join a collective effort or 'pool', in order to conduct research, development, demonstration, deployment and diffusion (RD&D), to produce and adapt technologies while implementing enabling conditions to overcome barriers, risks of a venture development, and common problems.

Technological integration could thus be the link for an integrated climate response and drive innovation to a clean technology revolution in the future. Clear opportunities in the developing world's projected long-term sustainable development would support it.

⁵ Initially these were found in Europe and North America, but later were extended to some emerging Asian economies for geopolitical reasons, and to some Latin American and African countries for commercial reasons. But the geographical map of trade and innovation has been changing too, particularly with respect to environmental technologies. For example, developing countries (particularly China) are becoming leading patent applicants for some types of clean energy technology.

⁶ For example, certain generators of electricity utilising photovoltaic and wind power technology must comply with restrictions in the design and construction of electricity generation facilities. For example: Japan vs. Canada – Certain Measures Affecting the Renewable Energy Generation Sector; and, European Union vs. Canada – Measures Relating to the Feed-in Tariff Program.

⁷ US vs. China – Measures concerning wind power equipment.

Technological integration is a collaborative and inclusive approach. It goes beyond the IPCC's definition of transfer of technology,⁸ as the transfer is not just one way from the provider of technology to the recipient. The intention is to integrate stakeholders in a consortium to form a 'public-private technology pool'. The group of stakeholders includes governments of advanced and developing countries, scientific and research institutions and their private sectors, international organisations and financial institutions (Figure 1). Technology integration can place both developed and developing countries on an equal level, as partners in terms of the contribution of knowledge to address the climate-change challenges. It promotes the use of all available knowledge, including local knowledge in developing countries, to solve local, regional and global common problems.

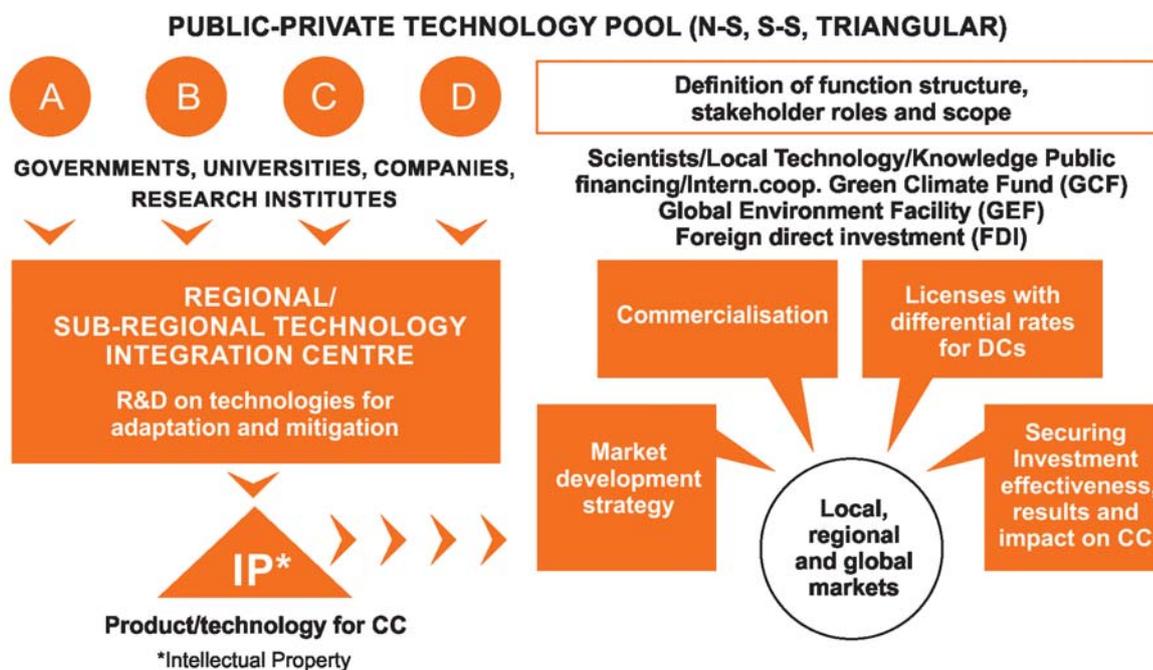


Figure 1. Proposal for technological integration

Technological integration would help countries to create enabling environments, to develop local capacities, to stimulate the establishment of regional clusters of innovation around those centres and to promote knowledge-based development. National Designated Entities (NDEs) from developing countries would help to align different small and dispersed climate projects and initiatives to their national agendas. This would integrate with their industrial strategies, thereby making them larger and attractive internationally.

A definition of the Pool's function, structure and scope is needed, as well as of the stakeholders' roles, and a market deployment and trade strategy. The scope will embrace the lifecycle of a venture and, therefore, will range from basic and applied research, going through the proof of concept, target market and business plan to the working and engineering prototypes, supplier and distribution contracts, and product information and sale, helping businesses to survive the so called 'valley of death'. Furthermore, the participants would also determine how licenses with differential rates could be offered to other developing countries and supervise how investment effectiveness, results and impact on climate change would be secured.⁹

Pools promote innovation and produce technologies according to national and regional/sub-regional mitigation and adaptation needs, while governments establish enabling conditions at local, national or regional levels through environmentally sound measures. The determination of needs will help to ensure that solutions are focused on demand-pull and not supply-push. Solutions will be based on adapting existing technologies

⁸ '... the broad set of processes that cover the flows of knowledge, experience, and equipment for mitigating and adapting to climate change among different stakeholders. These include governments, international organisations, private sector entities, financial institutions, NGOs and research and/or education institutions...It comprises the process of learning to understand, utilise, and replicate the technology, including the capacity to choose it, adapt it to local conditions, and integrate it with indigenous technologies.' (IPCC, 2000, p3)

⁹ Current mechanisms fail to integrate these development phases: some parties are eager for technology transfer whilst other parties want to introduce a product without ensuring the actual transfer of technology.

and producing new technologies, incorporating local knowledge and addressing current limitations of technology.

The inclusion of enterprises is important in the formation of pools. They can conduct RD&D and technological integration according to market needs and provide innovative products and services based on market demand (Caijing, 2013). The participation of firms from industrialised countries in those pools would be important as they could have cumulated RD&D and the needed technologies may require some adaptation/alteration. The involvement of users (e.g. for clean technologies) is also needed as they could give guidance to what is needed.

As climate change does not recognise national political borders and as countries already share biodiversity and other (atmospheric, marine, watercourse, etc.) natural resources, stakeholders should join efforts to address their common challenges. In that sense, these pools should be situated in regional or sub-regional technological centres in developing countries. Their role is to address local and regional needs by developing technology and RD&D, promoting co-invention, producing new technologies and adapting existing technologies for mitigation and adaptation. This would reduce duplication of RD&D and increase the complementarity of efforts to produce the technologies identified in the Technology Needs Assessments (TNAs).

Such pools already exist in other sectors. A number of examples could be found in the Montreal Protocol framework, with specific objectives in cooperation with government agencies and academic scientists¹⁰ that accelerated the pace to commercialisation of new products and reduced costs. As many authors (Sarma and Andersen, 2011; Thoms, 2003) remarked, the foundation of the relative success of the Montreal Protocol was the scientific and technological collaboration established between scientists, governments, NGOs, media and UN organisations. A similar kind of collaboration, among selected stakeholders, is proposed in the technological integration pools, where public and scientific and research institutions and companies will face barriers, risks of venture development and common problems.

A specific type of pool is the patent pool – a cooperative agreement among several firms to license as a group their respective patents to third parties. Although patent pools have long been suspected of promoting anti-competitive behaviour, their potential to integrate complementary technologies is recognised in several areas. Patent pools could reduce transaction costs, remove blocking positions, decrease infringement litigation and the uncertainties related to it, and promote the dissemination of technology (US Department of Justice and the Federal Trade Commission, 2007, pp. 84-85). As a consequence of this favourable position, patent pools are found in different sectors, mainly high-tech sectors like mobile communications and the pharma/biotech industry (Dequiedt and Versaevel, 2012).¹¹ The principle of a patent pool could be harnessed by technology pools by including governments, selected institutions and companies from both developed and developing countries working together.

Benefits

What potential benefits could be expected? Collaborative R&D activities would spread the costs and the risks of R&D; broaden access to technologies, technology know-how and proprietary knowledge; and access new markets (UNFCCC, 2010). In addition, technologies produced in developing countries with lower costs, would reduce IP confrontation. Participants have the ownership of specific technologies and could offer technology licenses with reduced prices to other developing countries.

Those pools would strengthen the existing Climate Technology Centre and Network (CTCN) infrastructure where they would be inserted as technology providers, widening the number of institutions incorporated in it. It would also complement other initiatives such as the Climate Innovation Centres (CIC), in order to develop synergies and to achieve technological integration at a global scale in support of a global sustainable development.

¹⁰ Program for Alternative Fluorocarbon Toxicity Testing-PAFT (1988), Alternative Fluorocarbon Environmental Acceptability Study-AFEAS (1989); at least six industry associations including PAFT and AFEAS were started with the goal of speeding the elimination of ozone depleting substances (Sarma and Andersen, 2011).

¹¹ MPEG-2 (1997), MPEG-4 (1998), Bluetooth (1998), DVD-ROM (1998), DVD-Video (1999), 3G-Mobile Communications (2001), One Blue (2009), Pool for Open Innovation against Neglected Tropical Diseases (2009) and Medicines Patent Pool (2010). (Dequiedt, and Versaevel, 2012).

What kind of products/services could be developed?

Both mitigation and adaptation technologies are needed. In mitigation for example: technologies to recycle and to process solid waste; to use renewable energies; to reduce the environmental impact of land-use and land-use change; to reduce the environmental impact of agriculture and of energy-intensive activities; and to develop sustainable public transport. In adaptation: technologies to put in place natural infrastructure and ecosystem service protection; to improve water availability; to adapt agriculture to new climate conditions, to improve soil productivity and agro-biodiversity management; to avoid the melting of glaciers; and, to monitor marine species' migration.

In the specific case of clean energy, it is not currently cost competitive with fossil fuels. Until it is, the planet will not transition away from carbon-based fuels (Atkinson and Ezell, 2012). Driving sustained-clean energy innovation through the technological integration centres in developing countries has the potential to develop clean-energy sources whose prices (without subsidies and carbon taxes) could be lower than fossil fuels.

How would this be funded?

An objective of the pool is to inject dynamism and attract a variety of funding streams: private foreign direct investment and other venture capital looking for profitable business opportunities and new markets. This would imply mutual benefits for all the stakeholders in effectiveness, results and impact. At the same time, governments of emerging and middle-income countries would be encouraged to make self-finance contributions to co-finance the establishment of facilities. For example, this could take the form of funding clean energy RD&D, and putting in place some incentives to attract scientists and companies.

International cooperation sources of finance, the Green Climate Fund and the Global Environmental Facility, would be important for developing countries, mainly for least developed countries. However, climate finance would not depend solely on those funds.

Conclusions and next steps

Climate-change negotiations and agreements depend upon improved economic integration, particularly access to technologies for climate mitigation and adaptation. The concept of technological integration offers a collaborative and inclusive approach to overcome many barriers (including IPR) and risks involved in venture development, and common problems. It is strongly linked to the actual economy and actual needs. Fact-based discussions can occur on the market and lifecycle venture gaps that could be filled by technological integration, particularly to address climate change. The traditional concept of technology transfer cannot do this and therefore should be abandoned.

Putting the concept into practice can occur in the form of technology pools. These bring together several stakeholders and offer many mutual benefits.

The proposal is a work in progress and will necessitate further development and discussion. Understanding the role of stakeholders in the public-private technology pools to develop RD&D will be vital. What sectors should be prioritised for both mitigation and adaptation technologies? Further exploration is needed on how those pools can attract financial resources, promote North-South, South-South and triangular cooperation; help countries to create enabling environments and develop local capacities. Also an assessment is needed of how the pool stakeholders with the ownership of specific technologies could offer technology licenses with preferential fees to other developing countries.

Finally, the launching of public-private technology pools as pilot projects under the UNFCCC will require assessment of its impacts on existing strategies, mechanisms and instruments, as well as how it links with the Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Plans (NAPs). Those pools would strengthen the Climate Technology Centre and Network (CTCN) infrastructure by being inserted as technology providers, while the CTCN could help in the identification of further projects to be developed by the centres, strengthen global scientific and industrial cooperation, while promoting knowledge-based development and becoming the new driver of technological change and innovation.

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Climate finance: capitalising on green investment trends

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Abstract

Finance is the supporting means for the implementation of mitigation and adaptation activities in an international climate agreement. However, discussions on finance under the UNFCCC umbrella have come to a stalemate on definitions. The most promising source of finance, the private sector, has become a polarising issue in the negotiations. Yet, outside of the negotiations, there is some good news: investors are becoming more aware of climate risks and considering the potential impacts on their investments. Universities and pension funds are actively considering divesting from fossil fuel. Many of the green bonds issued by development banks, and now by corporate entities, were sold out within minutes of issuance. If the potential demand for private-sector investment is to be harnessed, three key questions need to be addressed: How might the opportunities and challenges be used to catalyse the burgeoning interest in private financing for climate activities? What can the public sector do to encourage private climate-finance flows and the green bond market? How can environmental integrity be improved?

Negotiations on how private-sector finance could support climate-change mitigation and adaptation in the United Nations Framework Convention on Climate Change (UNFCCC) are at a stalemate. Despite being a critical element to a climate-change solution, the conversation on private financing is polarised in the negotiations (Zadek, 2013). Scepticism has been expressed on the extent to which private financial markets should contribute to the \$100 billion target for climate finance by 2020. Part of this scepticism stems from a justifiable concern that private markets are not primarily concerned with adapting to climate-change impacts. The latest assessment of global climate finance indicates a negligible amount of private finance attributed to adaptation activities, partially attributed to a poor understanding and tracking of adaptation finance (Buchner et al., 2013).

Meanwhile, the financial community is becoming more aware of possible physical risks to their investments due to the changing climate and extreme weather events. Investors also face an additional policy risk: impending climate policy can result in stranded assets that support fossil-fuel infrastructure. The rate at which we are moving towards a low-carbon future is slower than most analysts think is needed, but domestic and regional policies and discussions clearly point in this direction. Both physical and policy risks can translate into real economic impacts on investments.

Increasing investor awareness to climate issues is manifesting itself in several different ways. Although their impact may be negligible, campaigns to divestment from fossil fuels are gaining more media attention (Ansar et al., 2013; Welch, 2014). The FTSE group, a financial index company, in connection with Blackrock and the Natural Resources Defense Council, issued a new financial index series that excludes companies involved in fossil-fuel extraction or production. ExxonMobil shareholders called for increased disclosure of climate risk management. Activists at universities are also increasingly calling for divestment from fossil fuels, while a group of 17 philanthropies have signed an agreement to divest.

In parallel, the green bond market is flourishing. Essentially, a green bond is a debt instrument that finances projects that are environmentally friendly. New issuances of green bonds increased fivefold in 2013 to over \$11 billion, and are on target to double again in 2014 (RBC, 2014; CBI, 2014; Van Renssen, 2014). At the World Economic Forum this year, World Bank President Kim announced a goal of \$20 billion in green bonds in 2014, and \$50 billion by the UNFCCC Conference of Parties in 2015 in Paris (Bolger, 2014).

Big green potential

Although green labelling is only occurring in the margins of the debt market to date, there is strong growth and a large potential for shifting the bond market towards financing green activities. Only a fraction of the total bond market – 0.04% – could currently be considered green. However green bonds have already doubled in issuance in the first half of 2014, and some predict a green market share of 10-15% by 2020 (CBI, 2013a; The Economist, 2014). Table 1 illustrates the marginal green activity in the bond market to date, for corporate issuers as well as national and municipal government issuers.

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Corporations are the newest players in the green bond market, as issuance shifts from public-sector financial institutions to the private sector. The first green bond was issued by the World Bank in 2007.² Other development banks issued green bonds over the following years. In 2013, the first corporation (a Swedish real estate company) issued a green bond, as well as the first city (Gothenburg, Sweden).

Table 1. Green portion of bond market

Bond market overview		Green portion	
Type of issuer	Amount outstanding (\$ billion)	Amount (\$ billion)	Percentage
Corporate issuers (including financial issuers)	43 000	10	0.02
Government issuers (including municipal)	35 000	2	0.01
Total global bond market	78 000	30	0.04

Sources: BIS (2014), BNEF (2014), CBI (2014)

For context, if the green portion of the bond market increased to 0.12%, it would be equivalent to \$100 billion. Although the UNFCCC climate finance targets cannot be met solely through the bond market (it is largely agreed by negotiators that some portion of the target should be met through financing from governments), it makes for an interesting consideration of the potential of the bond market to finance solutions to the climate-change problem.

Institutional investors are also becoming more interested in climate-friendly activities, and are starting to pay attention to green bonds. TIAA-Cref, the Teachers Insurance and Annuity Association – College Retirement Equities Fund, invests in green bonds. UniSuper, the Australian teachers' pension fund, was the largest purchaser of the World Bank's Kanagaroo Green Bond (World Bank, 2014). Other institutional investors, such as PensionDanmark, Denmark's sovereign wealth fund, are investing directly in renewable energy projects, in part because of a current lack of liquidity in the green bond market (Environmental Finance, 2013).

Financing green infrastructure

Could green bonds play an instrumental role in financing climate activities? Although not a magic bullet, bonds are a well-known, replicable and scalable financial product. Faced with an opportunity to purchase green bonds that offer the same risk/reward profiles as non-green bonds, investors may choose the green option.

Bonds also offer a variety of opportunities for the public sector to partner with the private sector. Governments can issue bonds directly for national or subnational projects. Governments also have a strong role to play in de-risking bonds, including providing guarantees and supplementing credit ratings. In the current market, 80% of green bonds are government-backed (CBI, 2013a).

Bonds have a particularly interesting application with respect to climate change: they can supplement municipal budget shortages by financing capital-intensive green infrastructure projects when access to capital markets is limited. City and municipal budgets may face increasing pressure from climate change (OECD, 2010: 228). At the same time, cities have the authority over a significant share of local infrastructure projects. A municipal bank in Norway, Kommunalbanken, has issued a green bond to support climate projects including public transportation and smart grids. As infrastructure projects proliferate in rapidly urbanising countries such as China, municipal and city level applications of green bonds could be critical.

As green bonds are a relatively new financial product, they face a number of challenges. To be attractive for large institutional investors, green bonds need to have increased liquidity and high credit ratings. Long-term, credible climate policy signals and a financially-attractive project pipeline are the necessary foundations for supporting green financial instruments. And most importantly from the environmental perspective, green bonds need to have a positive impact on the environment.

² Disclosure: CICERO reviewed the environmental robustness of the green bond framework for the World Bank, and continues to provide independent 'second opinions' for other issuers.

Shades of green

How can the 'greenness' of a bond be determined and how do investors react to green labels? What are the implications of doing so? From an environmental perspective, there is no common definition as to what constitutes a 'green' bond (CBI, 2013b). Since the World Bank issued the first green-labelled bond, a range of green bonds have been issued, including those that are self-labelled green by the issuer, those that have undergone external review (e.g. second opinions) and those that are not labelled but generally viewed as environmentally friendly (e.g. supporting renewable energy investments). Many of these are focused on reducing climate impacts (some of which are labelled as climate bonds), but some also include broader environmental considerations. There is no consistency as to whether a bond is labelled 'climate' or 'green' according to the project investment categories.

Investors are asking for some level of transparency in green bond investments, but stop short of demanding an independent environmental review. With respect to the environment, this goes beyond transparency on what project types a bond invests in, to disclosure of the environmental risks of investments. The possibility of a 'headline risk' from a large, negative environmental impact or disaster poses a risk of share price losses to issuers. Therefore, credible environmental disclosure is critical when issuing a green bond.

Environmental disclosure is important in at least two stages of the bond investment cycle. When a bond is issued, investors need to know what risk they may be exposed to when they purchase a green bond. After the bond proceeds are invested in specific projects, the environmental impact of the projects should be reported back to investors. Thus there is a role for both *ex ante* environmental due diligence, and *ex post* reporting and verification.

Some issuers perform, or have independent parties perform, environmental due diligence before issuing a green bond. The Green Bond Principles, a declaration by a group of banks to promote transparency and some consistency in green bond issuance, note that the environmental integrity of investments is important, and enhanced by external expert reviews (Ceres, 2014). However, the Principles stop short of recommending environmental due diligence. The current market trends indicate that the green bond market is on the brink regarding whether due diligence is necessary – green bonds have been over-sold regardless of whether issuers have done due diligence checks.

In the current nascent stage of the green bond market, some issuers have used a third-party environmental expert for due diligence, but not all. Verification has occurred in a sampling of green bond projects that are part of routine reporting and verification systems in multinational development banks, but does not seem to be a regular occurrence in corporate green bonds.

It is possible that pushing too quickly for verification of environmental impact might stifle the market. The risk of suppressing new issuance of green bonds by imposing environmental requirements and verification is realistic, especially in the early stages of market development when investors on the whole act indifferently to the integrity of the green label. However, this risk needs to be balanced against the possibility of negative environmental impacts restraining investor interest in green bonds.

Verification may become more of a focus by investors if they are asked to account for the impacts of the investments. However, green bonds fall beyond the reach of a system for environmental credits, so no impact reporting or verification is required. In the instance that an environmental headline risk should occur, then the need for verification may become very strong in the green bond market.

Anecdotally, some issuers are reporting that green bonds are attracting new investors to the market. Further research is necessary to examine the extent to which this is the case, and the underlying motivations for the purchase of a green-labelled bond. An *ex post* assessment of the environmental impact of green bonds would also reveal further outcomes of the green bond market. However, the lack of project-level data from recent investments is an obstacle to further research at this time.

Catalysing green finance

Looking forward, the key challenge is how to seize increasing investor interest to support the significant climate financing needs in developing countries. What can governments do to tip the balance of the bond market towards green projects? What can researchers do to bridge the gaps between climate science and the financial community?

National governments can provide a critical de-risking function to financial products. In the case of green bonds, this could include insurance on currency or sovereign risk and credit enhancement of issuers. To catalyse the financing of urban infrastructure, national governments can partner with cities and municipalities to mitigate the risk of some of these investments. On the demand side, state-owned pension funds can be major investors in green bonds or other green financial instruments.

At the international level, the Green Climate Fund of the UNFCCC could de-risk climate-friendly investments in partnership with other financial institutions. De-risking is critical for adaptation projects, where private investments do not reach deeply. Further analysis could examine the barriers to government de-risking activities, and how to address them.

Further research, disclosure and analysis of the environmental integrity of financial flows are needed. This extends to green bonds as well, where the definition of 'green' is not clear, and the environmental impact is not always transparent. What impact are green bonds actually having on the climate and environment? Potential and realised environmental impacts need to be disclosed to the financial community to avoid confusion regarding green integrity, which in turn could hamper the growth in the green bond market. On the other hand, could too stringent environmental requirements stifle the market?

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